GLEANINGS IN BEE CULTURE

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EDITORIAL

By E. R. ROOT.

HONEY SOAP.

IN the *American Bee Journal* for October, Miss Emma Wilson tells how to make honey soap. The recipe looks as if it might be good, and we place it before our readers.

Cut 2 pounds of yellow soap in thin slices and put into a saucepan with sufficient water to prevent the soap from being burnt. Place on the fire, and as soon as all the soap has dissolved add one pound of honey and stir until the whole begins to boil. Then remove from the fire, add a few drops of essence of cinnamon, pour out into a deep dish to cool, and then cut into squares. It improves by keeping.

THE CUTTING OF BASSWOOD AND THE DECREASING OF BASSWOOD HONEY.

MR. M. V. FACEY, in the *Review*, blames the supply manufacturer and the honey-producer alike for the destruction of basswoods. Why, bless you, friend Facey, the amount of this timber that the bee-keeper or the manfacturer of bee-supplies uses is a mere bagatelle compared with the amount cut for the furniture manufactories, planing-mills, and packing-box concerns that have no connection with the bee business. If the manufacturer of bee-supplies were to use some other material for his sections it would not affect noticeably the price of basswood timber, nor would it increase the bee-keeper's honey crop except in some localities from which the manufacturer of sections draws his supply.

WHITE-CLOVER PROSPECTS FOR 1910.

REPORTS indicate that there is a fine prospect for white clover next year. In our own locality, for example, there never was a heavier mat of it than we see in the pasture lots in and about Medina. With a favorable winter and spring we may expect a big crop of white clover next year.

It is very often the case that after almost an absolute failure of white clover there will be a heavy yield from that source the following season, and, *vice versa*, when there has been a large crop, the yield will be light the next year. According to this rule, and especially when we take into consideration the large amount of white clover reported all over the clover belt, we may expect a yield next season.

SECTION COMB FOUNDATION; FULL SHEETS VS. STARTERS.

IN the *American Bee Journal* Mr. G. M. Doolittle gives a general history of the invention and use of foundation for section honey-boxes, bringing it clear up to the present day. After speaking of the fact that many prefer to use only starters because the bees involuntarily have to secrete wax scales in a downpour of honey he says:

However, as these downpours of honey can not be calculated on very often, there is no one at the present day but considers it economy to use sections filled with this extra-thin foundation.

He had previously spoken approvingly of the use of extra thin for the purpose.

WHY THAT BEE-CELLAR WAS A FAILURE; HOW TO MAKE A POOR CELLAR A GOOD ONE.

WHERE the climate is not too severe, it is undoubtedly better for the beginner to winter outdoors in double-walled hives or winter cases. The problem of cellar temperature, ventilation, and moisture is a complicated one; and to have conditions ideal there should be a proper balance of all three. Sometimes an excess of water or moisture does no harm; but a combination of too much moisture and *low* temperature is nearly always fatal. A cellar too warm, with lack of or insufficient ventilation, is equally bad. On the other hand, if a temperature that does not vary very much from 45° Fahr. can be maintained, the question of ventilation and moisture is not so important; but a high temperature always calls for a large amount of fresh air. One below 40 is apt to result in too large a consumption of stores, and over-feeding causes dysentery.

About this time of the year we get numerous inquiries, not only as to how to build a cellar, but as to the cause of bees not wintering in the cellar last year. To avoid repetition of the experience, the inquirer will describe his cellar and the conditions, and then ask whether he can correct the trouble. The following letter is a fair sample of some of those that we get. As it states conditions met by many another we reproduce it right here, together with our reply.

I wish to get a little information in regard to a bee-cellar I built last fall, which proved *not* to be a success in wintering.

I built a stone cellar 14 x 28, and 8 ft. high, inside measure, in a side hill, a mixture of clay and sand. About two-thirds of the cellar is in the hill, and the rest outside with a two-foot wall—no windows—only

one large stove in the front end. On top of the cellar I have a one-story frame building which I intend to use as a storeroom. The floor of this room is double-matched, with a six-inch space filled with chaff, and also with chaff on top of the floor. I made every thing as warm as possible, with two sets of doors. The cellar was new when I placed 140 colonies therein last fall. Of this number I lost about 40, and part of those that survived were weak, and the hives seemed very wet and moldy. Only two-thirds of the cellar was occupied.

The trouble seemed to be that the cellar was too cold most of the time—38 degrees. I finally put a six-inch pipe from the room overhead down into the cellar. This seemed to make the bees quieter, but ran the temperature down lower than ever. Sometimes I had it open and sometimes closed.

I put a stove in the cellar and ran the pipe out above the door. I kept a very small fire in the stove every other day, also through January and February. This helped somewhat, but after all it seemed to coax bees out so that they dropped on the cellar floor. The trouble seemed to be I could not make my ventilation work right. The ventilator I put in did not chase out the damp foul air, but let cold air down, as such air is the heaviest.

Now, I don't see how I can get this cellar warm enough without artificial heat. I have two plans I should like to submit to you. One is to set 2x4's around in the cellar next to the stone wall, and sheet it all up with flooring, making another wall and air-space (but still I would have no ventilation); and the other is to build an addition on the front end of the cellar, put in a stove, run a pipe through the cellar next to the floor and up through a larger pipe out through the building, something like the little diagram here shown. While the fire is going, have the large pipe open, and at other times closed. I think that this would work better.

Now, I wish you would consider my plans and tell me which you think is best. Do you think a ventilator is necessary when the cellar is warm enough? I am sure my cellar is too cold. The part of it which is outside, exposed to the weather, freezes through and covers over with frost and ice inside in cold weather. My cellar is endwise in the hillside, east and west, facing east.

FRED A. KRAUSE.

Ridgeland, Wis.

It seems very clear that the trouble with your cellar was due to several causes—too low a temperature most of the time, a very uneven one at other times, and lack of proper ventilation. When you applied artificial heat to warm the cellar every other day, you made the temperature too high on the day when the heat was applied, thus drawing the bees out into the cellar, and on the next day the temperature would drop too low. The alternate warming and cooling would get the bees stirred up. When it was warm the cluster would expand and consume largely of stores; then when it turned too cold it would have a tendency to induce dysentery. A lack of ventilation on top of it all made your cellar a poor place in which to winter bees. An extra lining on the inside would help somewhat; but in a climate like yours it would be our judgment that the cellar should be wholly submerged under ground. If the natural temperature of it runs down to 38, and stays there for months at a time, it would be necessary for you to employ artificial heat. The stove should be a very small one, and capable of dampering down so that only a very moderate warmth would be given off—just enough to maintain a temperature of about 45 degrees Fahr. Then it would also be advisable to have the chimney pass through a larger flue. The stove should be in the cellar, and the ventilating-pipes should pass through the upper room, and in connection it would be very desirable to have a sub-earth ventilator. This could be opened or closed, depending upon the outside temperature.

The two prime requisites in cellar wintering are uniform temperature, approximately 45, and ventilation. If the temperature goes much below 40 degrees, and stays there, it is *almost sure to prove disastrous* to the bees. For the purpose of heating your cellar we would advise you to get a very small drum stove, using no larger than chestnut anthracite coal. A kerosene stove would give off a bad odor, and therefore could not be considered. Bituminous coal burns too fast, and wood is no better.

We specified using no larger than chestnut coal. Sometimes a pea coal can be procured, and it will give just as good results for less money.

AN INTERVIEW WITH AN EXTENSIVE HONEY-PRODUCER.

WE recently had the pleasure of a call from Mr. Henry Trickey, of Reno, Nevada. His native State is Ohio, but for about twenty years he has been living in that western State where mountains and deserts abound. There are not many bee-keepers in Nevada, but there are a good many colonies of bees, for in that State no one is rated as a real bee-keeper unless he has over 100 colonies.

COMB-HONEY CARRIERS MADE TOO STRONG.

Mr. Trickey produces comb honey; and when we asked him if the distance which he had to ship his product to the market was not quite a problem he replied, "No, sir. It depends upon the amount of handling which the honey receives as to how much it is damaged, and not upon the distance it is carried. Comb honey may be just as badly broken up in ten miles as in a thousand, if it is not properly packed and if it is improperly handled by the railroad men. A good many have a wrong notion in regard to the crates or carriers. Bee-keepers often come to me and say that they are going to have the crates made stronger and heavier so as to withstand the hard usage. Now, they say that because they have not given the matter sufficient thought. A strong heavy carrier may not be broken up, it is true; but that is just the trouble. The honey in the carrier may be badly damaged; but if the carrier itself has not been hurt, the railroad company will do nothing about it. If we make complaint that our honey was injured in transit, we are only reminded that we did not pack it right, if the carrier itself is still in good shape. I say, then, the carrier *should be just strong* enough to carry the honey through in good shape, provided it is handled properly. Then if it is not handled properly, and the honey is injured, the carrier will be broken also, and the railroad company will have to stand the damage."

BEEWAY VS. PLAIN SECTIONS.

When we asked him what style of sections he preferred, he said that he used the only one which an extensive producer could afford to bother with—the beeway section, the plain sections being all right for a man with

eight or ten colonies who had the time to fuss with fixing them in the shipping-cases so that they would not be broken. His reason for this was that the surface of the comb is so near the edge of the section that there is great danger of mutilating it on account of there being no protecting corners. After a grocer cleans up several times after handling sections with gouged combs, he is pretty apt to declare that he does not want to bother with any more comb honey of any description. Grocers, he further said, do not always handle honey as carefully as they might, and they are often to blame for breakage, but, at the same time, if they are disgusted with comb honey they won't take any more at any price. For this reason our friend believes that comb honey should be given all the protection possible, hence his preference for the beeway sections.

OUR GRADING-RULES CRITICISED.

In the matter of grading, he thought the rules now in force are drawn too fine. If we would cut out about half of the subject-matter, and not attempt to go better than a No. 1, it would be much better. When asked to what grading-rules he referred he said he had in mind particularly the eastern rules; but, as for that matter, the Colorado gradings are only a little better. He would make both sets of rules simpler, leaving more to the individual judgment of the one who is doing the grading. He referred approvingly to the suggestion of some one who said that all No. 1 combs should comprise the best of the lot, the No. 2 should take in the next best, and so on down to No. 3. But we suggested that would make a grading which would vary according to locality and one individual's crop; that it was possible that Mr. A's grading would be higher or lower than Mr. B's; or that a Nevada grading would be lower or higher than a Colorado. He admitted the force of this, but said we must depend very largely upon the honesty of the producer; if he did not grade honestly and fairly, cut him out.

In speaking of the Colorado grading-rules he said they virtually made it necessary to sell the honey by the piece and not by the weight. He could see no objection to selling honey actually by weight, and then the seller and the buyer would make a deal on the actual quantity of honey bought and sold.

COLOR OF ALFALFA HONEY.

We asked him if the alfalfa in his locality was a light honey like that in Colorado. He replied that it was. We then inquired if he knew of any reason why Arizona alfalfa was darker in color than that of Nevada or Colorado. He did not share the opinion that the color of a pure alfalfa was dependent upon locality; that the difference in shade was due, he thought, to a slight admixture of another source of honey darker in color. In Arizona, for example, there were other sources on which the bees began working, and would be working about the time the alfalfa opened up. The bees would be gathering from both sources; and the result would be that, while the honey was largely alfalfa, almost entirely so, there would be a slight amount of some other darker honey in it, affecting its color slightly, but not its flavor, for he was free to admit that the quality of Arizona alfalfa is excellent.

In this connection he mentioned the fact that in and about the territory near Reno there is considerable clover, and, strangely enough, the honey from that source is a distinct amber and not a white honey such as we have here. So far as clover was concerned he admitted that locality did affect the color, for no other sources were in bloom at the same time.

EARLY OR LATE CUT ALFALFA.

We asked him if, in his locality, the ranchers were cutting their alfalfa before it was in bloom. "Not to any considerable extent." Then we inquired if, in his opinion, an early-cut alfalfa made a better hay than that which was cut while in bloom. That depended, he said; but for dairy purposes the early cut is doubtless better; but for stock-feeding the other is superior. Apparently the cut-before-bloom did not worry him very much; and in this connection he admitted that, even if the early cut made a better hay, the large ranchers are not able to get to it just in the nick of time, and, as a natural consequence, much of it will be cut when it is well in bloom.

STRAWBOARD SHIPPING-CASES.

Just before he took his car we passed some corrugated strawboard shipping cases. Directing his attention to these we asked him if he had had any experience. No, he had not; he thought they were too fragile for carload-shipment work. In this connection we asked if he was using corrugated paper to put under the sections in his wooden cases in lieu of drip-sticks. He was not. The only merit of the corrugated paper, in his opinion, might be in the fact that it would absorb drip honey where the wooden cleats would not. In this connection he explained that he was using pasteboard drip-cleats for this reason, and because they would stay in place better than the wooden cleats.

Not all of our readers, perhaps, will subscribe to his opinions; but we must remember that Mr. Trickey is an extensive honey-producer, one who owns and operates five hundred colonies. While he is a man of pronounced convictions, somewhat conservative perhaps, he is successful. He did not place very much value upon the opinion of the man who owned only a few colonies. He thought that many or all of them were inclined to rush into print before they had tested their ideas on a sufficiently large scale to determine whether they are of any value.

If our forefathers had followed this policy of exclusion we might never have had a Langstroth or a Huber, and many others who, though their interests in bees have been small, have given us some of the best things the bee-world has ever known. Perhaps we do admit too many of the little chaps in our ranks; if so, it is because the "woods are full of 'em." When the big ones *won't* write we have to do the best we can.

STRAY STRAWS

BY DR. C. C. MILLER

DR. FRIEDRICH KUEHL, the leader among Austrian bee-keepers, died Sept. 19, aged 72.

I TRIED feeding 3 parts sugar to 1 of water. Can't say I like it. Too difficult to dissolve the sugar. Ye editor's idea of 2 or 2½ to 1 is all right.

FOSTER'S "MEAT AND HONEY," p. 657, reminds me of my son Charlie. When a little boy he ate honey regularly on his potato. It's not so bad.

J. E. CRANE, after reading your third paragraph, p. 693, I know now what's the matter with you and me. We didn't get enough shaking when boys.

EIGHTY TONS of wax used at Medina last year! Whew! That much thin super foundation would cover 44 acres. In the usual 3⅞×15¼ strips it would reach 1125 miles.

G. M. DOOLITTLE estimates the amount of honey a single bee gathers at ⅓ oz., p. 694. Let me try my hand at the problem from another direction. Since the field-life of a bee is 26 days, if a colony with a field force of 30,000 bees can gather 15 lbs. of honey a day for 26 consecutive days, making 390 lbs., then one bee will gather the thirty-thousandth part of that 390 lb., or $\frac{1}{5}$ oz. But there is that "if."

WILLIAM GEORGE JORDAN appreciates the dandelion as much as A. I. Root, but from a different standpoint. He says, *The Circle*, 249: "The wayside dandelion is passed by with half-tolerant contempt because it is commonplace. Naturalists claim it is king of the vegetable kingdom. It is one of the most perfect forms of the largest, oldest, most widely diffused, and most highly finished order of plants. It is of a far higher type of plant life than a rose or a lily, or even a cedar, a palm, or an oak."

YOU DON'T need a small hive for a baby nucleus. You can use just as few bees in a hive of full size with two Langstroth frames. [That would not hold true at Medina. The big hive is too large, so also its frames. In a little hive the bees, on the other hand, can warm up the interior of it, because they have only a very little, comparatively, to warm. But perhaps you mean that a small bunch of bees can be put in a big hive. Yes, but they can not begin to give the results in queen-rearing that they could if given a small hive.—ED.]

A. I. ROOT didn't tell us, after all, p. 715, how the chick cuts its shell so as to get out. When a boy I was taught that the shell is broken by the little knob that is on the top of the chick's bill, which knob disappears in a few days. Is there any thing in that? [Your early teaching, according to the statement of Mr. Ralph Root, of the Root Incubator Company, is correct; indeed, he showed to us this little knob, and how the chick, by the upward pressure of the bill, makes a crease clear around the shell. After the chick has been hatched a day or two this knife or little cutting edge disappears.—ED.]

I HOPE that Hurley-Root controversy will not close till we *know* something about that winter nest. I suspect each is right from his own standpoint. [We were, of course, speaking from the standpoint of the one who is wintering bees *outdoors*, as that is the plan we use almost entirely. Possibly Mr. Hurley was speaking from the standpoint of one who winters *indoors*. But whether bees are wintered outdoors or indoors, they will make a winter-nest if the feed be given *early* enough; but, of course, if they are put immediately into the cellar late feeding and the consequent splitting-up of the cluster by slabs of stores would not necessarily be particularly harmful; but we would prefer to have winter-nests, even for cellared bees. There is a period in the fall, before bees are put indoors, when they will have many cold or chilly days. It is during this time that the colony will suffer somewhat if its cluster is divided up by solid slabs of syrup.—ED.]

IN DISCUSSING sealed covers, absorbents, etc., it is possible that other factors not considered play an important part, and help to account for diverging views. I very much doubt whether enough importance has been attached to the idea advanced—was it by Jay Smith?—that the sides of the hive must be *colder* than the top. Much the same idea was held by the late C. F. Muth, who urged that the important thing was to keep the *top* warm. If top and sides be equally warm, there will be more condensation of moisture at the top than at the sides, for the vapor rises. In C. F. Muth's locality, no protection was needed at the sides—only on top. Now, suppose with his usual protection on top he had added protection at sides until the sides were warmer than the top. That would have made the top, where it was colder, the place where the vapor would condense, causing bad wintering. Further north there must be protection at sides, but enough more must be added on top so that the sides shall still be colder than the top. Whether absorbents or sealed covers, we don't want moisture on top; and whatever moisture condenses on the sides there will be just that much less moisture to be condensed above. [We wish some of our readers could go out into our home yard, during the middle of winter, and look at some of our colonies under sealed glass covers. Sheets of glass just the size of the top of the hive are imbedded in putty to make a hermetic sealing. Over this is placed a tray containing planer-shavings, as illustrated in this issue. At any time during mid-winter the amount of moisture, if any, can be readily seen. This is never directly over the cluster, if it can be noticed at all, but will be found clear to the outside corners. Sometimes it can be seen where it had trickled down on the sides. Bees are always nice, warm, and dry. Colonies under absorbing cushions with upward ventilation do not look so nice and bright.—ED.]

BEE-KEEPING AMONG THE ROCKIES.

By Wesley Foster, Boulder, Col.

PRICES OF HONEY.

Since the bulk of the comb-honey crop has been shipped out of the West, there has been a pronounced advance in price. The demand for white comb honey in car lots can not be supplied, as there are no localities now where as much as a car can be got together. The small amounts of honey scattered throughout the honey districts will soon be absorbed by the local markets or by local shipments to eastern and middle-west points. Comb-honey brings around $3.00 per case; somewhat above for choice stock, and under $3.00 for second grade. These are the prices grocers pay, while jobbers are not buying any to speak of unless at about $2.25 to $2.50 per case. The market in many Colorado towns has been hurt by farmer bee-keepers bringing their honey to the grocers and taking whatever they will give. One man sold ten cases of nice white comb honey at $1.75 per case because he had hauled it around town all day and did not want to haul it home. His price when he came into town was $2.75.

Extracted honey is in good demand, and brings 7 to 8 cts. if white and in new cans. Dealers do not pay this, however.

COLORADO BEE CONVENTION.

There are two things wrong with our State association—or, at any rate, two that can be changed. First, the membership is away below what it was several years ago, caused by the loss of interest through poor seasons. By effort and personal solicitation we can again have several hundred live members pushing the association's work, and attending the conventions. The second fault in in our association work is that bee-keepers who join get nothing except the satisfaction of knowing they are helping to keep the association alive. The association should carry on a campaign of education along honey and bee lines through the papers of the State and by lectures and addresses by competent men. What is encouraging to many members is that what is hoped for does not lie beyond reason. We can do a great service to our State work with what we already have. There are many members who are anxious to see more done; and if a large attendance can be secured at the convention the start will be all the better. The time is Dec. 7 and 8, and the place is the Senate Chamber, State Capitol, Denver.

IN THE SHOP.

Our shop is now nearly empty of honey, only a few culls remaining that are still unsold. The last of the No. 1 and 2 grades was shipped early in October. The most of the honey was No. 2 on account of color and finish. The season was unsatisfactory, and our crop was about one super to the hive. There are, perhaps, sixty cases of culls or No. 3 honey in double-tier cases that weigh 17 to 19 lbs. net. They bring $2.00 and $2.25 a case. I have not figured in cents; but $2.75 would be close to the average price of the No. 1 and 2 grades. One who has had experience in grading honey and selling it soon sees the advantage in grading close. The regular grades are sold at a good price without any quibble, and the culls find a ready sale for as much per pound of honey as the No. 1 and 2.

We had about 900 cases of honey from a little over 800 hives. The increase was about 150, but that will not much more than make up for the previous winter loss.

Now that the bees are all prepared for winter, the entrances contracted, covers and bottom-boards fastened on, each yard fenced off from cattle, there is no need to visit the out-apiaries more than once a month.

With a good fire in the shop, supers can be overhauled, separators and section-holders scraped, sections folded and startered, and any other work for next year's crop can be done when it is disagreeable outside. The foundation-starters work much better if the room is warm; and then if the shop is a comfortable place to work there will be no good excuse for loafing around the house.

With twenty to thirty thousand sections to fold and starter, and 1500 supers to be cleaned, filled, and repaired it will use up five or six weeks very easily. There will be broken tins, weak joints in supers, broken and cracked section-holders and separators.

Many of the supers are shallow on the bee-space over the sections, caused by shrinkage of the lumber in our climate. Several hundred supers have an eighth-inch strip around the top edge of the super to make a proper bee-space. These supers were all right when new. This is the best way we know to make these shallow supers usable at all. The strips have a tendency to split off when prying the super loose from the cover. We nail them on with a liberal supply of cement-coated nails.

The past season more supers were put on the hives than got filled, so we have many supers that are daubed, some with propolis, and the section foundation gnawed by the bees. The question often comes up as to the amount of stain that will disqualify a section for use a second season. When the section is stained or mildewed enough to be recognized as an old section after the honey is finished, that section should have been discarded. A few streaks along the edge where the section and section-holder join will not matter much; but if the stain is spread over the surface, or the section shows mildew, the best mission for it is to kindle the fire. A section may not seem badly stained; but the bees will have another chance to daub it next season, and the discoloration from weathering is something also to be considered.

NOTES FROM CANADA

By R. F. HOLTERMANN.

THE ONTARIO BEE-KEEPERS' CONVENTION.

Officers for the ensuing year: President, Wm. Couse, Streetsville; First Vice-president, W. J. Craig, Brantford; Second Vice-president, W. A. Chrysler, Chatham; Secretary-Treasurer, P. W. Hodgetts, Department of Agriculture, Toronto.

THE NATIONAL INVITED.

The hearty and unanimous response which the resolution inviting the National Bee-keepers' Association to Toronto received speaks well for the interest which will be taken by Canadians in the convention should the association accept. Canadians feel that the fact that this is the second year that Canada has been under consideration, and that this really North American association will not have seen Canada for fifteen years, should bring the convention to Toronto. Special railroad rates, offered during the time of the Toronto exhibition, will be a strong inducement to the convention.

THE NEW YORK DELEGATION.

We had a strong delegation from New York State. S. D. House, Camillus, N. Y., is a host in himself; and what one Ontario member said we all say. "He knows what he is talking about, and what he says is always to the point." No address awoke greater interest, or was followed with closer attention, than that by P. I. Clark, Borodino, N. Y., on queen-rearing. The jewel, set in gold, of his address, in my estimation, was when he gave the simplest method of requeening by putting to one side of the hive a comb of brood, separating it from the rest of the hive by means of a tin which acts as a tight division-board, and which also folds over sufficiently to separate the top of this compartment from the super. In this a capped cell is placed that is within two or three days of hatching. This cell is protected by means of a cell-protector. In this compartment the young queen is fertilized, and at the proper time after the old queen has been removed, the nucleus with the young queen and the full colony are united by means of a small round hole in the tight division-board.

REQUEENING.

The officers of the association have evidently been much impressed with the inferiority of the average queen. H. G. Sibbald dealt with that subject in his usual happy manner. As a foul-brood inspector he saw the need of better queens. He did not want a colony queenless for even a few days if it could be avoided. Some years ago when feeding back honey to complete sections he noticed that, as soon as the colony got the swarming impulse, the bees did not take up any more feed, also that a colony slackens up in honey-gathering when it gets the swarming impulse; also that queenless colonies do not work as well as those that have a queen. Mr. Sibbald favored a good strain of Italians.

When Mr. Sibbald stated that he was careful not to rear queens from cells produced under the swarming impulse, Holtermann felt he could now settle a small portion of the score against him through Sibbald's joke at H.'s expense. After gravely expressing his deep interest in Mr. Sibbald's method of eradicating the swarming impulse he stated he was going to take the last speaker to a dairyman's convention. Cows switch their tails in a disagreeable manner when being milked, and Mr. Sibbald could explain to them how, by cutting the tails at birth from the calves, in a few generations they would breed a cow that would no longer have the disposition to switch.

F. J. Adams, Brantford, ably connected the need of rearing good queens with honey production. He pointed out how, with modern methods, non-swarming, stimulating the queen, or something beyond nature's methods, had to be employed to keep good queens at the head of the colony.

FOUL BROOD.

The reports of inspectors showed that the sum of $2500 and the work of the fourteen inspectors had been entirely inadequate to cover the needed ground for inspection. Between sessions I heard of four county associations that have asked that more time and money be spent in this work during the coming year, and one county has asked for an inspector—viz., Simcoe.

European foul brood has made headway; and a resolution submitted by R. F. Holtermann, seconded by Alex. Dickson, Lancaster, Ont., was carried:

"*Resolved*, That the members of the Ontario Bee-keepers' Association view with alarm the fact that cases of European foul brood have been found among bees in Ontario; that we desire to place ourselves on record as, first, strongly favoring action on the part of the government that will, by thorough and careful inspection, locate every hive affected; second, that the Provincial Government take any action necessary which shall enable it to secure complete control of affected colonies." This was passed.

A PURSE TO MR. WM. M'EVOY.

I do not want to close this brief report without saying that Thursday's regular program was broken into by Mr. M. B. Holmes, Athens, Ont., asking the president to call upon some one to produce Mr. Wm. McEvoy.

After a little search the object of interest was produced, when he was presented with a purse and address "on behalf of bee-keepers generally, and members of the Ontario association in particular," in view of the fact that he had been the originator of the method of treating foul brood now generally recognized as the best in the world. The address stated that Canadians are proud that McEvoy had done this. The Germans have invented almost every thing that has developed modern apiculture; the United States has very largely improved upon these inventions; but a Canadian has discovered how to grapple with this scourge.

CONVERSATIONS WITH DOOLITTLE

AT BORODINO, NEW YORK.

LOCATING AN APIARY.

"I have thirty-four colonies of bees and am about to move to a new locality. How should the hives be leveled?"

"It is calculated that the entrance, or front of the hives, or the doorway, if you like, is better at the ends of the frames, and the hive should be perfectly level from side to side, and slope somewhat toward this entrance or front, enough to carry off the water when it rains. This also helps the bees keep the floor or bottom-board clean, and many suppose that, where the bees build their own combs, they are more likely to be straight within the frames. The whole, however, is on the calculation that your combs in the surplus apartment run the same way as do those in the hive below."

"But suppose that they do not."

"Then the hive should be level both ways when the sections are on."

"But how about the rain and the floor-sweeping, in this case?"

"As you have the sections on only when the colony is very populous, the bees will take care of this matter at such times; and to fix matters as they should be at all other times I use two half-bricks to each hive; and at all times when the supers are not on, the back end of the hive is raised up on these two pieces of brick, which gives about the right pitch toward the entrance. When the supers are put on again the next season these pieces of brick are taken out and left beside the hive or under the bottom-board when the hive is level again."

"How far should the hives stand from the ground?"

"Here good authorities differ. Some say from a foot to eighteen inches, while others think from three to six inches better. I used to lay two pieces of inch board on the ground where I wished a hive to stand, and level them. On these I placed the bottom-board, which was ¾ inch thick, with cleats 2 inches thick nailed on the under side of it, these preventing the bottom-board from warping. This raised the hive about 3½ inches off the ground, after the pieces laid down got fully settled, and made a fairly good stand for the hive. But of late years I place four half-bricks on the ground, level them, and on these I place the bottom-board, and the hive on that, so that, after they are settled down during one year's stay, the hive is not far from four inches off the ground, this being, to my mind, about the right distance. Then we can use an alighting-board, with hives thus near the ground, which could not so easily be done if the distance were a foot or more."

"Where hives are set two feet high on cool days in early spring, when every bee is of the greatest value, many bees fail to get home by being blown to the ground, or, in a benumbed condition, drop under the hive in the shade, where they die of exposure."

"But are there not objections to such low setting?"

"The objections are that toads will get to the entrance of the hive in the evening and catch the bees; and ants annoy them more; but I consider neither of these to be compared with the first.

"How near should the hives stand to each other?"

"My apiaries are laid out on the hexagonal plan, the hives being ten feet apart in the rows from center to center, and the rows ten feet apart. Many place them closer, some as near as five feet; but I think that, where the ground can be had without too much expense, the saving of queens when going out to be fertilized, the less mixing of bees when setting from the cellar, and the ease with which the ground can be mown and cared for, more than pay for all of the extra cost of ground and the extra travel which the ten-foot distance makes."

"How do you get the hives arranged in hexagonal form?"

"Take a line of the desired length, according to the number of hives you wish in any certain apiary, and near one end tie a white thread or string. Five feet from this tie a piece of red cord, and then a white one five feet from the red, and so on till you have red and white strings alternating at five feet from each other the whole length of the line. Now stretch the line where you want the first row of hives, and stick a little stake at each white thread. Then move the line ahead ten feet and stick the little stakes at the red cords. Move ten feet again, sticking at the white, and so on till you get as many stakes stuck as you wish hives at this place. Now level off the ground to suit you at each stake; put down your four half-bricks for each of the four corners of your bottom-boards to rest on, and you are ready for the colonies. For convenience and beautiful appearance this is superior to any thing else I know of."

"Just one more question: In what direction should the entrance face?"

"This is something that practical apiarists do not entirely agree upon. However, all, I believe, think it is better not to face any hives north of an east and west direction. I always have mine face south; but many think southeast should be the way, for then the morning sun will start the bees out to gathering nectar early in the day. But really I see little difference in any southerly direction."

"Why not face them toward the north?"

"The facing of hives to the north is very objectionable, as it nearly precludes the flight of the bees during winter, and much of the time during early spring and fall, and also allows the cold north winds to blow in at the entrance, thus retarding brood-rearing, which is a disadvantage in building up colonies to their maximum strength for the harvest from white clover."

GENERAL CORRESPONDENCE

FIGHTING BLACK BROOD.

How Dr. Miller Grapples with the Disease Among his Bees; the Frames but Not the Hives Disinfected; is Infection Ever Carried into the Supers?

BY DR. C. C. MILLER.

Beginning with the spring of 1909 I decided to give up the Wilson apiary and keep all my bees in the home apiary. I was especially thankful for this when I found that European foul brood was all through the apiary. It is more convenient to fight foul brood in one apiary than in two. Here was the situation early in July: 93 colonies affected with the disease; 22 colonies in which no bad brood could be discovered at any time throughout the season, and a lot of nuclei whose condition I can not now tell. An inspiriting state of affairs, wasn't it? At least I would have the chance to learn something.

I at once determined to break up all colonies that were not of fair strength and throw all the rest on foundation. Before I had a chance to carry out this program in full, events so shaped themselves that I changed my mind, and only 56 colonies were thrown on foundation.

Dr. E. F. Phillips thought a second shake was not necessary; so, instead of the usual shaking upon starters, and, four days later, throwing on foundation, I at once threw upon full sheets of foundation. No attention was paid to the condition of the hives—nothing whatever was done to disinfect them. The frames were boiled in lye, and used again. A big iron kettle outdoors had a fire built about it, and into this was put enough water nearly to fill it, and two or three cans of concentrated lye added. From time to time water was added as it boiled away, and more lye added. Four or five frames were put in the kettle, then soused up and down with a pitchfork, and in a very little while they were taken out and thoroughly rinsed in a tub of cold water. That made them very clean. But the lye was kept boiling hard. Most of the frames were as good as new, and the expense was small compared with the expense of new frames.

The first colony was shaken upon foundation; all the others were *brushed*. The first thing we knew, some colonies that had been treated left, bag and baggage. However, they didn't take the frames of foundation with them. (First and last, nine colonies thus deserted.) We concluded they were hunger swarms, the bees gathering a little every day, but probably not enough for their daily needs. So the next we brushed had sections partly filled given to them, these sections being taken from diseased colonies. This not proving entirely successful, we tried a radically different plan, which plan we followed for all the rest that were put on foundation.

We brushed *all but one comb*. That comb was left in the hive at one side. Next to it were given two empty frames with not the least sign of a starter in them. Aside from these three frames the hive was left empty. Three days later we generally found at least a little start made at building comb in the empty frame next the full one, and some eggs there. In a very few cases the bees had made a start in the second empty frame. Sometimes no start was made in either frame (remember the dearth), in which case we waited till there was. Then we took out the old filled frame, left the one frame with the start made in it, and filled up the hive with foundation. After a start was made on the foundation, we sometimes took away the frame which had been partly filled with comb, so that it might not be finished out with drone comb, and sometimes we left it.

The rule is to treat foul-broody colonies in the evening. With so many cases on hand, that was not convenient. I suppose the object of operating in the evening is to avoid robbers. It seemed to me that we would be full safer to operate in the earlier part of the day when the bees were scouring the fields for what little could be found than to wait till evening when they had given up the fields and were prowling around trying to rob everywhere. So we did none of the work in the evening, but at any time of day when robbers were not troublesome. Whenever there was any sign of robbers, we stopped work.

Some one may say I was unwise to do so many things against rule. The only reply I need make is that not one of the 56 colonies showed the least sign of the disease afterward, and I can but speak well of the bridge that carried me safely over. But please remember that European (not American) foul brood is under consideration, also that there was a dearth. With American foul brood, or in a full flow, results might be different.

With regard to operating in the evening, it is an unpleasant time to work, and I don't believe it is always the safest time, so far as robbers are concerned. In a buckwheat flow I would rather take the forenoon.

As to disinfecting hives, we know that, in thousands of cases, hives without disinfection have been satisfactorily used, and it is entirely possible that in the cases reported adversely the disease may have occurred from other causes. At any rate, the proportion of failures seems to be so few that I'd rather take the chances of treating them over again than to disinfect all the hives.

I fed sections taken from foul-broody colonies. Is there any positive proof that in any case bees have taken the trouble to carry the infection into the surplus apartment? Certainly no harm came from it in the present case. If it has done harm in any other case, then possibly the dearth may have made a difference.

Before I tried it, it is very doubtful if you could have convinced me that it would be a

safe thing to leave in the hive a foul-broody comb when shaking. Indeed, I had no idea, in the first place, of following exactly the plan that I finally did follow. I intended to leave the foul-broody comb three days, or long enough for the bees to make a start on the empty frame next to it, then leave this latter two days, taking away the foul-broody comb, at the end of the two days leaving nothing but foundation. The idea was that this would not give the bees such a shock as to be suddenly thrown upon nothing but foundation with all their combs taken from them at once. But in some way I fell into the shorter and easier way, thinking that there was a bare chance that it might work, and I was feeling just a bit desperate about the bees deserting. You would hardly believe with what intense anxiety I scanned the newly built comb when the oldest brood in it was nearly ready to seal, to see if any of it was diseased. Always it was healthy, and I felt sure that if this comb was all right the foundation would be. And it was—every time. Again the question comes: If a flow had been on, would the result have been the same?

The editor of GLEANINGS had hinted that he would like to have me try the Alexander plan. I am greatly given to experimenting; but with so serious a matter as foul brood I hardly felt like fooling with a plan that had not proved entirely successful in all cases. Later I relented, and—but that's another story.

To be continued.

THE NATIONAL PURE-FOOD LAW.

Its Relation to Honey-dew; the Favored Few.

BY J. A. CRANE.

While I should like to see the pure-food law amended so that what the bees store in the hive for their own food supply, when taken from them might be called honey, whether gathered from fruit juice or aphides, we probably shall be unable to get such a change. But if all the bee interests in the country were as powerful and as united as the glucose interests are, the commission would probably be able to see no more harm in calling honey-dew pure honey than in calling glucose corn syrup. What greater farce could be imagined than our present pure-food law as it now stands and is applied? The greatest sinners, viz., the glucose people, the canners, and the whisky interests, appear to be able to get almost any ruling they wish; but let the man who has a few sections of honey with a few cells of honey-dew in them look out how he sells it or he may find himself in prison.

The way I did with what honey I had with dew in it was to send it away as clover, basswood, and honey-dew, which was just what it was; and as the statute claims to be against misbranding, it seems to me that I should have been more guilty to mark good clover and basswood as honey-dew than to give the actual facts, even though the good honey was unavoidably *thrown* into bad company.

PREVENTING GNAWING OF SPLINTS.

I should like to suggest that the Miller splints might be coated with some substance like shellac, or some other preparation, and made so hard that the bees would be unable to tear them down. As I understand the case they gnaw only the lower end of the splints, so it would not be necessary to coat more than a short distance from the end. I have never used them, but have often thought of trying some; and if the gnawing by the bees is the only point against their use it would seem that some one used to paints or chemicals should be able to find some easy way to overcome that fault.

Marion, N. Y.

[While, apparently, some big interests have secured rulings that they have asked for, and some smaller interests have been turned down, yet it is, nevertheless, a fact that we have one of the best if not the *very* best pure-food law, and the best executed, probably, in the world. Canada and some other countries are wishing they had something half as good. If Dr. Wiley and his corps of assistants were left alone, all would be treated alike. Taking it all in all, we most emphatically disagree with our correspondent when he says that "no greater farce could be imagined than our present pure-food law as it stands and is applied." While we admit, in the matter of honey-dew, that some bee-keepers suffer some little hardship, yet in a broad and general way they now have practically no competition from glucose mixtures masquerading under the name of "honey." Most States have pure-food laws of their own that are in strict conformity with the national law. All territorial and interstate business comes under the scope of the national law. The fact that some of the adulterated products that can be sold in some States may and probably would go across the borders into other States is a strong barrier against a class of manufacturers who would, if they dare, put on the market adulterated honeys, canned goods, and jams. They dare not take chances.

It is not a violation of the national pure-food law to put on the market a honey that contains only a small percentage of honey-dew. Any honey containing a small amount of honey-dew that is of good flavor and color can be sold as honey, if we understand the ruling. It is only the ill-flavored stuff, or the honey that contains a very perceptible quantity, that must be sold under the name of "honey-dew honey." In many cases this does not work a hardship but an actual benefit to the honey trade at large. Indeed, it would be a positive damage to the market if a bee-keeper were allowed to put a nasty honey-dew on an unsuspecting public and call it *honey*. There are some pure honeys that are so vile in flavor and dark in color that they also ought to be put under the same ban for table use.—ED.]

FULL SHEETS OF FOUNDATION IN SECTIONS DEFENDED.

A Reply to Friedman Greiner; only Extra Thin Foundation Used in Split Sections.

BY J. E. HAND.

The article by Mr. F. Greiner on the use and abuse of foundation in sections, page 528, would seem to call for a reply from me, especially in view of his error in assuming that I find it necessary to use brood foundation in split sections. This is doubtless due to a former statement of mine that I might be compelled to use foundation heavier than extra thin in split sections.

Permit me to say in this connection that the trouble from buckling of foundation in split sections to which Mr. G. refers exists only in the imagination of those who have condemned these sections without giving them a trial. In justice to myself it is proper to say that *I use only extra-thin foundation in split sections.* Mr. G. is, therefore, jumping at conclusions when he assumes that I use brood foundation in them.

His statement, that those who use full sheets of foundation in sections are catering to the demands of the seller instead of the consumer, are, it seems to me, wide of the truth. He appears to forget that the seller is in touch with the consumer; and unless he caters to his wants he must quit and go out of business. The fact that the seller demands a certain kind of honey is prima-faciæ evidence that the consumer prefers it.

Mr. Greiner's statement, that the consumer rarely demands that honey be attached to the section on all sides, and capped to the wood, is doubtless true; and yet if given the choice, that is the very kind he will take in preference to the kind Mr. G. describes as being fastened at the top with only two little legs at the side, and none at the bottom, with an open space between the honey and the wood.

I don't quite see how any one in the light of our present grading-rules should call such an article gilt-edged. It is the *appearance* of comb honey that sells it, and the eating qualities that hold the customer after we once get him. The difference between the appearance of a section of comb honey that is built from full sheets of foundation and one from small starters only, is wide enough to include the whole scope of scientific comb-honey production. The difference in the eating qualities is so slight as not to be noticed by the average consumer, and exists only in the fact that there is a trifle more wax where full sheets of foundation are used. However, since most people eat honey with bread, the small amount of wax contained in a mouthful of honey could not be detected, even by an expert.

I plead guilty to the charge of producing the kind of honey that commands the highest price in the open markets; and because I can't produce such an article in my location with starters only I prefer to use full sheets of foundation in sections. The rapidly increasing demands for such honey speaks louder than any argument that can be brought to bear on the other side of the question.

No doubt Mr. Greiner is able to produce a very fine article with only small starters of foundation in sections; but the point is, will it pay him to do it? This question is fully answered by his statement that he would have made a great deal more money had he used full sheets of foundation in sections during the last 25 years. On the whole it would seem that he has little to show for his 25 years of self-sacrifice along this line, for he does not say that he is able to get five cents more per pound for his product, which he would have to do to make himself good.

I have been a producer of comb honey on a small scale for more than 30 years; 14 years of this time I delivered a good share of my produce direct to the consumer; and while I don't remember a single complaint about the foundation, I have had patrons object to light-weight sections before I knew enough to use full sheets of foundation. Sections of honey are largely sold by the piece, and light-weight sections, like poorly filled boxes of berries, are viewed with suspicion by the consumer, and justly so.

Birmingham, O.

KEEPING BEES IN A WARM ROOM THROUGH THE WINTER.

An Interesting Series of Experiments Showing the Effect of Artificial Heat on Bees.

BY SAMUEL SIMMINS.

This subject appears to strike the editor of GLEANINGS as a matter of considerable importance, and is one that claims some attention every few years. At one time it was a most fascinating hobby in the writer's own experience.

Some thirty years ago I placed a colony of bees in a greenhouse in mid-winter, at a temperature that never went below 70°; and while, when the sun was warming up the house during the day, about 110° would be maintained. It was a very interesting sight, in the depth of winter, to see the bees actively carrying in artificial pollen which I sprinkled on deal shavings in a box at the further end of the house, where they were loading up with a right merry hum.

After the first day or two the glass did not trouble the bees in the least, and they would fly in a continuous stream direct to the pea-flour, and, when loaded, straight back to the hive, as though they were unaware of any glass boundary, or that there was a wider world beyond. Thin syrup was supplied at the same time, and fairly large patches of brood were established, hatching out in due course. And so this interesting game went on until spring came in; but just here is the crucial point—no material increase in numbers was secured, and the sequel was not unexpected.

The hive was set outside, and then the result of artificial heat, *out of season*, became apparent. That queen had been through her season of laying, and now claimed a very natural and well-earned rest; while the bees, being all quite young, with no element of hardy adults among them, made no attempt to pull up, as do unmolested stocks when starting off after their long winter rest. The fact was, the "vim" was not there, and, for all intents and purposes, that stock was about worthless for the new season's work.

COLONIES IN A WARM ROOM WITH ENTRANCES OPENING OUTSIDE.

I have in *early* spring applied heat to stocks standing with free entrances to the open air. The bees would expand, and a large brood-nest would be developed; but ultimately there was no progress, for the simple reason the adult bees were induced to fly too frequently, and many would be lost or worn out too quickly.*

The queens, as will always be found the case, having started too early and too rapidly, are not in position to continue at high pressure just at the period their best work is required. In this connection it should not be overlooked that, with stocks strong and healthy, and in normal condition, the queen claims a short and much-needed rest, in mid-season, by the act of swarming. She deposits few or no eggs for a day or two before swarming, hence with non-stimulated and reduced ovaries she is able to fly with the swarm—an act otherwise impossible. For a week or ten days thereafter she is not again forced to her full capaciiy, the short rest having been very beneficial.

HEAT APPLIED IN SEASON.

When not applied too early I have found artificial heat somewhat beneficial. The application should be made just *after* bees are developing normally, and when plenty of natural pollen is to be found in fairly mild weather. Under these circumstances the general progress is rapid, and with such applied heat bees are ready for the supers in from two to four weeks earlier than usual. It is evident that comb-building is then carried on more quickly than without artificial heat during an early honey-flow.

WARMING THE SUPERS.

Even where the actual stock is not thus subjected to artificial heat in season, a judicious warming of the supers, where cold nights are the rule, will add largely to the apiarist's profits. Combs are built at an astonishing rate, and the bees always find plenty of room in the supers, and, moreover, the work being continuous, the queen is left free to follow her natural inclination among the stock combs, and a larger population is naturally the result.

For drawing out section (or other) foundation prior to the honey-flow, I have frequently advised the use of a hot brick wrapped in flannel; and also flat hot-water tins, cased in enamel cloth and wrapped round with warm material. These are placed on the super; and with gentle feeding many sections can thus be got ready for the honey-flow, insuring rapid work when the food time comes. Of course a lamp-heated boiler would be more effectual, and a small proportion of the colonies kept would prepare enough drawn combs for the whole apiary. The object is not to prepare a lot of combs with deep cells, but to get them "started" without being stored, just as if a holder with sections were placed between brood for twenty-four hours—another effective plan of obtaining drawn section combs.

Many American friends procured my pamphlet of 1886, and they will remember the stress therein laid upon the importance of a systematic preparation of whole sets of drawn combs in *all* sections ready for the current season's harvest.

ARTIFICIAL HEAT VERSUS NATURAL DEVELOPMENT.

It is apparent, from my own experience, that there is no profit, but a decided loss, in causing bees to breed to a great extent during winter, or too early in spring. I prefer, and I have no doubt most practical owners prefer, a colony that will sit still, do no breeding, and therefore consume but little store, until the first great flight when natural pollen can be gathered in abundance. From that moment a higher temperature is developed naturally, the queen begins to feel her power under the general (and genial) stimulus of awakening life, and the adult hardy workers do not appear to diminish in numbers until there are enough young sufficiently hardened to take up the burden of a whole hive full of brood.

CONFINED BEES PRODUCING WAX.

My greenhouse experiment reminds me that at a little later date (1886) I confined a 3-lb. swarm in a large canvas-covered room for the purpose of determining the quantity of honey that would be required in producing a pound of wax. Until that period it had been asserted that twenty pounds of honey were lost for every pound of wax the bees were compelled to produce; and down to quite a recent date some authors (who knew of my experiment) have continued to publish that exploded theory.

The bees flew freely in the canvas room, it being in autumn; but they had no access to either pollen or water, beyond the slightly diluted honey I fed them for the purpose in view. I gave the process in detail in "A Modern Bee-farm," and the ultimate result was that I found it required some 6½ lbs. of honey to produce 1 lb. of wax. This was beautifully white, with no trace of a yellow tinge when molded into one block. Under free and favorable conditions, doubtless less than five pounds of honey are really required in secreting that quantity of pure wax, free from pollen. With wax at 35 cts., that would be 7 cts. per lb. for honey; consequently, wax is not, apparently, produced at a profit by the modern bee-keeper, though

* If young bees hatched in winter can not fly within a reasonable time they die off wholesale.

it is possible he may at times produce new combs cheaper than he can buy foundation. I am not sure that artificial heat applied during this experiment would have given a more economic result, because the bees, being fed freely with diluted honey, developed a fairly high temperature. But what economical production can compare with the mighty roaring industry displayed by the bees when the weather is hot, and untold wealth of golden nectar is spread over a thousand acres around them?

Heathfield, Eng., Nov. 1.

[Mr. Simmins is a bee-keeper who has done a large amount of experimental work along practical lines. We have before referred to the fact that he has made some discoveries in the line of methods of management that have been many years ahead of the times.

In the matter of keeping bees in a warm room the result of his experiments are quite in line with our recent experiments, and with those conducted by our Mr. A. I. Root along in the early 70's. Taking it all in all we are thoroughly in accord with all that our correspondent has to say.—ED.]

INTRODUCING QUEENS.

The Flour Method Practical and Safe.

BY ELMER J. WEAVER.

It is a simple matter to introduce queens by dusting them with flour if they are reared in the same yard, and taken from one hive and introduced into another inside of a few hours. The results are the same if the queens are taken to another yard, provided they are not out of the hive too long.

The method I employed with success was to remove the old queen, place the frames back in the hive, and dust several small handfuls of flour over the tops of the frames in such a manner that the flour got well mixed with the bees between the frames. The queen was then coated thoroughly with flour and run down between the combs, followed by a good sprinkling of flour.

This plan was not entirely successful when practiced with queens received through the mails, so was modified in the following manner: After removing the old queen, the bees were shaken from the combs into the bottom of a hive, dusted thoroughly with flour, and the queen coated with flour was dropped among them. The frames were then replaced carefully, and the hive not opened again for a few days. In each case tried, this plan proved successful, with the exception of one weak colony that was so demoralized that, before reaching a normal condition, robbing started in and the queen was missing. This reminds me that, if this plan is made use of during the robbing season, the entrance should be reduced to a single bee-space or else the work postponed until near sundown, so that the colony can regain its normal condition before morning.

Several months ago I requeened eleven colonies for a friend living about thirty-five miles from my home. The bees were the most vicious of any that I ever tried to handle. The only way in which they could be quieted was to use one-third tobacco-stems and two-thirds partly rotten wood in the smoker. To find the queen a queen-excluder was tacked to the bottom of a hive-body and set on top of a hive containing several combs. The bees were shaken into this empty body, and a few puffs of smoke started them through the excluder down into the hive below. After finding the queen the bees were dumped back into the hive, dusted thoroughly with flour, and the queen put into flour and then dropped among them. The hives were then not opened for several weeks. On account of the difference I did not examine the bees again; but about Oct. 1 my friend looked hastily through the hives and reported sealed brood in nearly all of the hives requeened. He did not make a thorough examination, on account of the crossness of the bees, and so did not attempt to find the queens, the presence of brood showing that all were accepted. At this same time my own colonies had no unsealed brood in the combs, as the extreme drouth in this section stopped all pollen supplies some weeks earlier.

I believe that those who try this method will not go back to the slow cage plan again, as the flour-introduced queens are laying before the others are liberated by the bees.

Ronks, Pa.

A KIND WORD FROM INDIA.

My dear Mr. Root:—Not long ago a very accomplished lady whose life is full of good works wrote me: "I have not lived in vain if I have been able to give the missionaries a good laugh." Measured by this standard you too have not lived in vain. GLEANINGS has been coming to us for over 20 years, and grown and improved with the years. We thank you. My husband does not find much time for reading, but he manages to see what *you* say, pretty often, and to have a good laugh over many things. We not only enjoy your sermons, but are often much benefited by them, strengthened in the faith, and in efforts for the good of others. "You in your small corner, I in mine," so we are all working for the same end, the salvation of the world, and it matters not whether for east or for west.

There is not much inducement to bees to make any amount of honey here, as they can eat directly from the fresh flowers; still, they do produce some very nice honey, and once in a while we get some that is eatable. If we could get it first hand or in the comb it would be all right; but the natives are much given to straining it through any cloth, and that may be one taken from off the body, often so dirty that Mrs. Root would not allow her floor to be scrubbed with it.

I was glad when you said you and Mrs. Root kneeled by your bed at night. All these things strengthen somebody, and help some one to better effort. Twice a day with my hand in my husband's we kneel before our God. Life is sweet with all its sacrifices, and full of work, with no holidays. Our oldest son is here in the work with us. Our four daughters are in school in Newton Center, Mass., and we hope they too will be missionaries when the time comes.

We had fifty inches of rain here during June; but when we have six months of no rain we get so dry that the world almost burns up; jungle fires are terrible, and we lost heavily last spring by them. May you long live to preach through GLEANINGS as well as in your life.

MRS. M. C. MASON.

Tura, Assam, India, Sept. 1.

MEETING OF TEXAS BEE-KEEPERS AT COLLEGE STATION, JULY 27-30.

Through the coöperation and perseverance of the members of the State Association the State legislature was induced to make an appropriation of $3000 for ridding the State of foul brood.

BEE-KEEPERS IN TEXAS HOLD ANNUAL MEETING WITH TEXAS FARMERS' CONGRESS.

BY T. P. ROBINSON.

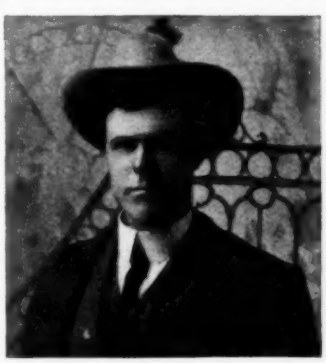
The Texas Bee-keepers' Association, being a branch of the Texas Farmers' Congress, met in general session with that body at College Station, Texas, July 27 to 30, and transacted much important business for the association. Many interesting subjects were discussed by the members pertaining to apiarian craft, and much lasting good was accomplished, especially to the younger members of the body. Through the coöperation and perseverance of the members of the association the last State legislature was induced to make an appropriation of $3000 for the purpose of ridding the State of foul brood. A few years ago the State passed some very good laws relative to foul brood, but there was no money set apart to defray the expenses of inspection work. Now that we have both the law and the means we are hopeful that we can attend to foul brood effectively.

At this meeting of the association the funds in question were applied so as to do the greatest amount of good for the bee interests of the State.

We had with us (and we were glad to welcome them) men from Arkansas and Cuba. It was a treat to hear these gentlemen discuss beedom from foreign fields. The question-box discussions were instructive and entertaining.

The following officers were elected for the ensuing year: T. P. Robinson, Bartlett, Texas, President; W. H. White, Blossom, Texas, Vice-president; W. T. Childress, Batesville, Texas, Secretary-treasurer. The association closed in harmony and good will, hoping to meet again in annual session with the Farmers' Congress next July. It is hoped that we shall have a large attendance at that time, and that much good may be accomplished.

Bartlett, Texas.



T. P. ROBINSON,
President of the Texas Bee-keepers' Association.

SPECIALIZING IN BEE-KEEPING.

BY BENJ. A. FORD.

For years I have considered making bee-keeping my sole occupation; but I have always been held back by different writers who advise against the plan of depending on bees alone for a livelihood. I have been keeping bees quite extensively for more than twenty years, and always looked forward to the time when I could depend on them alone for a living. During the past few years I have been very successful with bees, and so about a year ago I took up bees as a business; but, having had considerable experience with poultry, I kept chickens also on a small scale. Besides these lines, I had a small farm to work to some extent. The fact is, however, that I should have been better off at present if I had made bee-keeping my sole occupation. The bees have made up for the loss on the other two lines, and have given a good margin besides, over and above the expense of the

GEORGE H. REX AND SON'S BEE-SHED, PERMANENTLY BUILT OF GOOD LUMBER AND ROOFED WITH CORRUGATED IRON.

whole venture, in spite of the fact that this locality is not considered one of the best for bees. But the past season or two have been very favorable for the bees, and not so favorable for farming and poultry-raising. Perhaps, in the long run it might be well to carry the three lines together.

From my own experience I believe that, for the time and capital required, bee-keeping will be found more profitable than almost any other rural pursuit, provided the bee-keeper thoroughly understands his bees and his locality. I would not advise any one to take it up alone (unless he has carried it with something else) until he has proved to himself that he thoroughly understands his bees and locality, and until he is sure that he can make enough in good seasons to tide over the seasons that are less favorable.

North Abington, Mass.

BEE-SHEDS.

A Good Shed Saves the Labor of Carrying Hives in and out of a Cellar.

BY GEO. H. REX.

The picture shows one of our two shedded apiaries; the other one is about half a mile from this one, and contains 16 colonies in the same kind of shed. The hives are kept in these sheds summer and winter, the shed serving as a protection from the cold in winter and the hot rays of the sun during summer.

The picture also shows two old-fashioned straw hives which we have for a relic. We have about half of our bees in eight-frame chaff hives and the rest in single-walled hives, and they winter about the same in both kinds.

With this kind of shed there is no bother in putting bees in a cellar during winter, and much work is saved, as the hives stay on the same stand all the year round. We have kept bees since 1896, and have run for comb honey exclusively.

Stettlersville, Pa.

UPPER ENTRANCES AND DOUBLE ENTRANCES.

Their Advantage in a Hot Climate.

BY J. M. HOMESLEY.

I notice the plan by B. Walker, page 533, Sept. 1, for getting the bees directly into the supers without having to pass through the brood-chambers first. On one end of my brood-chambers I nail a board flush with the upper edge to make an alighting-board, beveling it so that the water will run off. I place this body on the bottom-board so that this upper alighting-board will be at the opposite end from the main alighting-board below. Then I put on a queen-excluder and over this the super, on the under edges of which I have previously nailed strips, ½ inch thick, on the two sides and one end. By putting the end without the strip over the upper alighting-board I thus secured the second or upper entrance. I have found that the bees seem to prefer the upper entrance, as they worked from this the most. I have a loose ½-inch strip, 1½ inches wide, that will just fit into this upper entrance, so that at any time when I choose I can close it.

I had 48 colonies this year, and had only ten swarms. I got as much honey as any

one in this locality, and increased my apiary to 135 colonies, all of which are supplied with stores for winter.

The double-entrance plan is very convenient for dividing. When the flow is about two-thirds over I get my queen-cells ready, go through the yard, and place a cell in each of the bodies above the excluder, and leave them until the young queen is laying. I then set the upper hive on another stand whenever it suits me. I generally leave my colonies with the double stories and the queen in each story until spring, and then separate them. I am aware of the fact that some may object to an entrance at each end of the hive; but down here, where the temperature sometimes is 115 degrees Fahr., I find it better to have a current of air through the hive. I sometimes close the lower entrance from one-half to two-thirds, so as to lessen the lower space that the bees have to guard. I like this plan so well that I expect to run my whole yard this way hereafter.

D'Hanis, Texas.

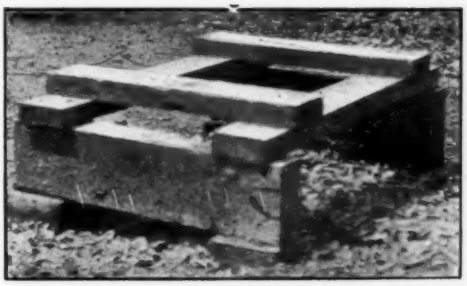
WINTER CASES.

Some Improvements Over the Usual Plan of Arranging Them on the Hives; a New Hive-stand.

BY ANDREW M. KECK.

I use the regular dovetailed winter cases with good success; but there are several changes that I have made which I would like to mention. I prefer a flat galvanized cover, since it is easier to put together, and is more suitable for the use of shade-boards on top. Hive No. 4 in the illustration shows one of my winter-cases with a home-made roofing-iron cover.

On the front and the back of an ordinary single-walled hive, as shown by hive No. 5, I screw a cleat as long as the winter-case is wide, on which the case may rest, using two screws in the front cleat and one in the center of the back one. I cut a quarter-inch notch on the upper side of each end of these cleats, which will hold the edge of the winter case. Then I lay thin boards around the hive, which are supported by these two cleats, as shown by hive No. 7; and when the winter case is slipped down over them, these thin boards form a floor for the case so that the planer-shavings are prevented from falling down through. This plan supports the winter case well above the hive-body, so that there is room for an abundance of packing over the top. I use no pads or cushions, but pour the chaff or packing material in loose, taking care to put in all that the case can possibly hold. If I should have occasion to examine the colony at any time when the packing-case is on, I can merely remove the cover and put it on the ground, bottom side up, and with both hands scoop the packing off into it while I make whatever examination is necessary.



DETAIL OF KECK'S HIVE-STAND.

I always leave the deep side of the bottom-boards up; but I contract the entrance with a notched stick, one of which is shown on the cover of hive No. 7 in the illustration.

When the winter case is used on divisible-

KECK'S METHOD OF SUPPORTING THE DOVETAILED WINTER CASES OVER THE HIVES.

brood-chamber hives, it is rather difficult to examine the lower section while the packing is on; but this is about the only bad feature that I can see.

My hive stands or foundations are shown under all of the hives; but the construction that I now prefer is the one shown in the second illustration. Instead of a second pair of 2x4's just under the hive bottom-boards, I now use two more pieces of inch material laid flat on the other two as shown I let this whole hive-stand rest on pieces of bricks at each corner. These stands are cheap, since there is no need of accuracy, and they do not quickly rot out.

Odon. Ind.

FIELD MEETING OF MASSACHUSETTS BEE-KEEPERS.

BY E. C. BRITTON.

The Massachusetts Society of Bee-keepers held the most successful field day in its history at the bee bungalow of Henry W. Britton, at Stoughton, Mass., Aug. 7. There were 150 present, and 30 new members were added to the Society. It was voted to make the dues one dollar per year.

Mrs. G. A. Everbeck, of Winthrop Center, won the prize, a fancy queen, for the best section of honey. Britton Brothers played two selections on cornet and trombone; Dr. Stone, Professor of Botany at the Massachusetts Agricultural College, spoke on the subject of honey-plants, and identified as many as he could of those contributed by the visitors.

A vote of thanks was extended to Mr. Britton for his hospitality.

Canton, Mass.

"PAULOWNIA IMPERIALIS," A "HIGH-PRESSURE" TREE.

BY A. I. ROOT.

Last year I had a paulownia that had stood the previous winter, and put out a great lot of branches. Had it wintered safely we should have had quite a lot of blossoms, and very likely considerable honey, as it is a honey-plant. When I got back from Florida I decided that the entire tree was O. K., and I was watching to see the buds start out and blossom. Every thing seemed to be going all right until in May, when the buds or little leaves seemed to come to a standstill. I looked around the roots, and saw that a lot of shoots were coming on with great vigor. I made haste to cut them off clear below the surface of the ground, hoping to turn the growth into the upright tree; but more shoots kept starting out. The tree had evidently decided to abandon the old trunk and start anew from the ground. It made me think of my sitting hens when I am trying to make them adopt *my* program instead of their own. The tree, in spite of me, seemed to be "of the same opinion still," and I finally gave up to it by cutting out the old trunk and letting it have its own way in growing a new one. I felt like the man who ordered his dog outdoors. When doggie sneaked off under the bed his master said, "Well, go under the bed if you wish to—just so you obey orders." My tree "obeyed orders," and the picture that Huber has taken shows what it was in the middle of October. Several years ago a leaf from this tree was so wide that, when a yardstick was laid across it, there was an inch or two of the leaf projecting beyond the yardstick. Now, this paulownia is one of

FIELD MEETING OF THE MASSACHUSETTS SOCIETY OF BEE-KEEPERS.
At this meeting there were 150 in attendance, and 30 new members were enrolled.

THE PAULOWNIA-TREE THAT WOULD HAVE ITS OWN WAY.

my favorite trees. Even if it does die down to the ground every winter, it is worth all it costs to see it come up and "climb" when warm weather comes. Of course, it needs good soil. The building right back of the tree is at the present time my auto-house. It was formerly one of my cold-frame greenhouses, and as a consequence the soil is very rich where you see the tremendous growth of plants and foliage.

MANAGEMENT OF LARGE APIARIES IN CUBA.

How Conditions there Differ from those in the United States

BY FRANK RFIMAN.

Fifteen hundred colonies of bees distributed among four or five apiaries are about all that one man can manage with the help obtainable in Cuba. The honey-flow in this immediate vicinity is over by the last week in December, and at this time it is necessary to leave enough honey in the lower story to last the bees until the 1st or 15th of March, when a new honey-flow begins. During this interval there is very little to do except to melt up combs from the occasional queenless colonies or colonies containing drone-layers.

At the last extracting I remove all the supers, as the hives contain but few bees and brood. All the old combs are melted up, and the brood-chamber filled with new combs. About March 1 I begin to put on supers again, using as many drawn combs as I can spare for each super, but never more than five such combs in a nine-frame super, as every alternating frame should be empty. One reason for this is that the queen is kept in the lower story until the brood-combs are filled with brood; and another reason is that the bees will then fill the empty frames with combs. If the new comb built is drone I cut it out for wax; but if of the worker size I use it for the new swarms. In this connection I will say that I never use comb foundation, as the honey never comes in with a rush here, and the bees usually only gnaw away the foundation. After the first of March I look through every colony once a week.

My frames are 21 inches long, 6 inches deep. They are made of ⅞-inch material cut into ½-inch strips. These narrow top-bars enable me to look between the combs without lifting them out and thus save much time.

March, April, May, and June are the main swarming months; but there are liable to be swarms any month except during December, January, and February. I make artificial swarms when practicable. My plan for this is very simple. After the queen fills the brood-chamber with brood, and has about four of the combs in the super filled, I take these upper combs out and place them in an empty hive, alternating them with empty frames. I do not look for the queen, as this takes time. I put the old hive in another place, and in a week I fill the new hive with combs and brood, and do not otherwise disturb it until I put on supers. In this way I lose only about ten per cent of the colonies on account of queenlessness. (If I should add the combs of brood after the young queen is hatched, the bees would almost surely kill her, even though she had been laying for a week.) In a week after the old hive has been moved, the bees will be working in the super, and in less than a month the colony will be strong enough to repeat the same process, or the extra combs can be used to hatch in some other hives.

In March, April, and May we extract about every ten days; we usually have five helpers, and extract about four barrels a day. At every extracting we cut out all the drone combs or old combs, and replace them with empty frames, alternating with the combs between. We melt up these undesirable combs for wax.

The spring honey-flow lasts until June 1, and then there are hard times for the bee-keeper until Oct. 1. Last year I fed seven 300-pound sacks of sugar; but this year I fed ten sacks, because the season was a month later, on account of heavy rains. We have had as much as 6 inches of rainfall in 2½ hours; 10 inches in three days, and 25 inches in a month. I believe the average rainfall in the United States is only 27 inches for a year. The rain always falls in the afternoon; and after one inch falls, the bees usually do not work until eight or nine o'clock the next morning.

October is a good month, and the bees swarm considerably; but at this time we do not make artificial swarms, as the white-honey flow begins Nov. 1. We hive all the bees on full combs so that they will be ready for the crop. In November and December, during the best flow, which is all white, we extract each yard every seven days, and we get from five to ten barrels, usually, a day. Last year, during the last extracting, we cut out combs, which, when melted up, amounted to 600 lbs. of wax.

On the first of November of this year I expect to change to comb honey in 4x5 plain sections. I am making wide frames for the same supers that are on the hives now, and will replace the nine frames with seven wide frames containing in all 28 sections. I formerly used a T super holding 40 4x5 plain sections; but I found that was entirely too large for Cuba. About the first of November the queen begins to lay fewer eggs, so that the hive has a smaller force of working bees, and at best the gain is not more than five to fifteen pounds of honey per week. I use only white combs in the sections for starters. My supers are at present full of white comb. I cut this out of the frames and divide it into squares to fill 25,000 sections. I dip the square pieces of comb in hot wax and stick them on the tops of the sections.

In the manner above described I raised 70,000 lbs. of comb honey in two years. In the United States this would not be practicable, as there is no white comb when the crop begins. I look at all the supers each week, and take out the finished sections, always keeping those that contain honey together near the center of the super, so that when the season ends there will be but very few unfinished sections.

We use 24-section shipping-cases packed eight to the carrier, with plenty of hay. Reports show that my honey reaches the State of Indiana in perfect condition; in fact, the honey from Cuba is said to reach New York in better condition than that shipped by rail.

Cauto, Cuba.

"WEEPING" HONEY.

A Serious Problem Confronting Some of the Bee-keepers in the South; Comb Honey that Becomes Water-soaked After Standing.

BY H. F. HART.

Honey oozing through the cappings, as mentioned on page 644, Oct. 15, has been a "bête noir" with both comb-honey and extracted-honey producers these two last seasons, and as yet we have been unable to get any solution. Some of us have taken the matter up with the Department at Washington, but so far as I can learn the officials there have examined only extracted honey, and not that in the comb. I wish to say distinctly that it is not old or frozen honey, but perfectly new honey that weeps; and, what makes it worse, is that it is almost impossible to detect the sections that will weep later.

During this past season I have graded and packed some very fine fancy white honey that looked just perfect, and had it stored under ideal conditions, only to find, a few weeks later, that the whole lot had to be repacked, one-fourth or more weeping.

There is no rule, either, in the weeping section. I have had all the 8 outside sections weeping, and the other 28 perfect; then, again, a patch on the top in some and in others a patch on the bottom, or one side perfect and the other weeping. I have returned these sections to the hive, and the bees clean them up, and late in the season the only mark of their being imperfect is the very convex appearance of the cappings. Supers left for a long time on the hive are apt to have a very considerable quantity of wax daubed all over the cappings as if the bees were trying to stop a leak. This is not confined to the supers; but the same state of affairs can be noticed in the brood-nest.

The source that the honey was derived from I am not able to determine; but sweet clover, white clover, persimmon, and *Trifolia recumbens* I know were blooming. I wrote, offering to send the Department at Washington typical sections, but they preferred to have samples of extracted, which I do not think would throw the light on the matter that the new honey in the comb would.

There is one peculiarity with this weeping honey when extracted: After whole or partial granulation it increases from 15 to 20 per cent in bulk, and the resulting mass granulates in a very fine crystal; in fact, it is more like butter, while our other honey granulates in large grains, although from the increase in bulk one's first thought is fermentation.

There is no sourness resulting — in fact, many prefer the butter honey to the large-grain honey. I am much interested in having this matter solved satisfactorily, and hope that some of your scientific contributors will take the matter up.

I wish to add to the list of flowers whose pollen might be found in Mr. Baldwin's honey, p. 639, titi and the black tupelo, which would both be blooming about the same time as orange. Bees also gather considerable from the loquat, which blooms earlier than either. Gallberry and sweet bay would also bloom about the same time.

Allenville, Ala.

[On page 644 we mentioned four conditions that might account for "weeping" honey; namely, age, freezing, rough handling, and source. Apparently the last mentioned was the cause of the weeping referred to on page 644.

It is doubtless true that, in some seasons, and especially from some sources, the honey is not thoroughly ripened before it is sealed. If that is the case it would have a tendency to work and expand.

Again, honey is deliquescent — that is, it has a tendency to absorb moisture and become thinner. Assuming that the cappings

1 2 3 4

HOW TO HANDLE A FRAME HAVING A COMB READY TO DROP OUT.

under consideration were somewhat porous —more so than usual — the honey might absorb water. That being the case, its volume would be increased, with the result that the honey would force itself through the cappings, causing the so-called "weeping."

If any one else has any thing to offer on this question we should be glad to lay it before our readers.—ED.]

HANDLING COMBS INSECURELY FASTENED IN THE FRAMES.

The Right and the Wrong Way; the Question of Wires and Splints.

BY E. R. ROOT.

We always advise the use of wired frames to hold the combs so that they can be handled rapidly; but a large percentage, yes, the majority, of bee-keepers do not wire. Perhaps they have the idea that it is too much work to string wires back and forth through the end-bars—that they have got along without wire heretofore, and they can do it again. If they consider it a useless expense they are practicing false economy; for fifteen cents' worth of wire will secure the combs in a hundred frames; and then, too, the fussy, tedious operation of handling combs like eggs will take enough time in a whole season to make up for the cost many times over.

But perhaps Dr. Miller and his friends might recommend in place of wires wooden splints. Doubtless for comb-honey production the splints are better; but some have had trouble from the bees gnawing around them; and for the purpose of extracting, they will not hold a comb as securely to the frame as wire passing back and forth the comb and through the end-bars, or through top and bottom bars.

No matter what the merit may be of either wires or splints, the facts are that the majority do not use them; therefore they will have a great many combs insecurely fastened to the frames. In nearly all cases there will be no attachment to the bottom-bars, and in many instances only partial attachments to the end-bars. When such combs are heavy with honey it is important that they be handled carefully; and for the benefit of the beginner we suggest a method of procedure that will avoid any breaking out.

Lift the frame out of the brood-nest, as shown in Fig. 1. If for any reason you desire to see the other side, raise the left hand and lower the right one until the top-bar is on a perpendicular line. While in this position—see Fig 2—revolve the frame like a door on its hinge until the other side is next to the operator. Drop the left hand and raise the right one, as shown in Fig. 3, until the top-bar is at the bottom, as shown in Fig. 4. When ready to put back, reverse the operation. When so handled, there will be no strain on the comb, as might be the case if the comb were turned over with the top-bar kept constantly on a horizonal line. In the height of the honey-flow there are many combs which, if handled in this way, would fall out of the frames, mutilating the combs, smashing bees and brood, and possibly arousing the fury of some bees. If the learner acquires the habit of handling a frame as shown in Figs. 1, 2, 3, 4, he may save some unpleasantness later on.

Of course, if he is wise he will wire his frames in the first place, and save all these false motions for all time to come. Why, in this moving-picture series of articles that is precisely what we have been trying to teach; but when a beginner is determined to practice false economy, then we try to show him how to work, even if some of his movements are unnecessary when the proper appliances are used.

BEE-KEEPING IN NEW ZEALAND.

Is it Possible to have Brood-rearing Started too Early in the Season?

BY H. BARTLETT-MILLER.

On page 179, March 15, F. H. Cyrenius says, "A colony wintered in a warm room will be too far in advance of the season to be profitable." This theory has been so much advanced recently that I am in a quandary as to the outcome of my next season's crop. On the 7th of July I went through my 78 colonies and discovered that half of them had five combs containing brood, and nine colonies had six frames with brood. Although all colonies had ceased breeding in the middle of April (which is the beginning of our apology for frosty weather), the 7th of July, when I made the examination, was only eleven days from our midwinter. Our seasons, of course, are exactly opposite to yours. Now, if your bees, when starting brood-rearing in March, for instance, are too far advanced to be profitable for a crop, what

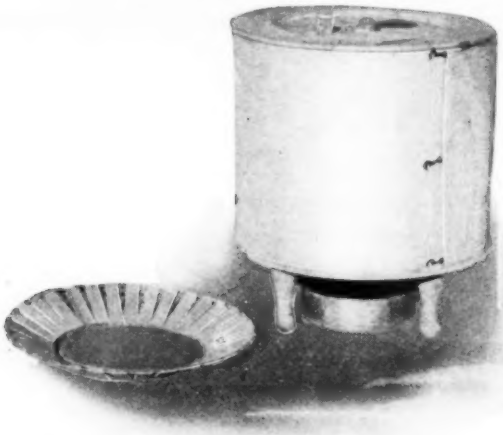


FIG. 1.—THE "NOVICE" "SIMPLICITY" INCUBATOR.—SEE POULTRY DEPARTMENT.

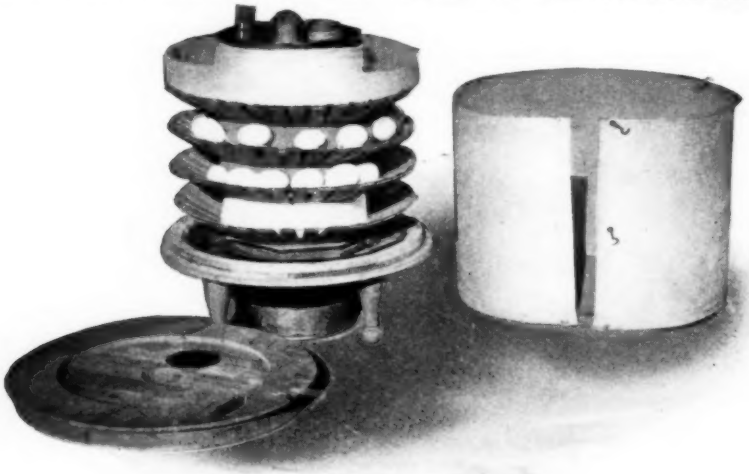


FIG. 2.—THE SIMPLICITY INCUBATOR OPENED UP.

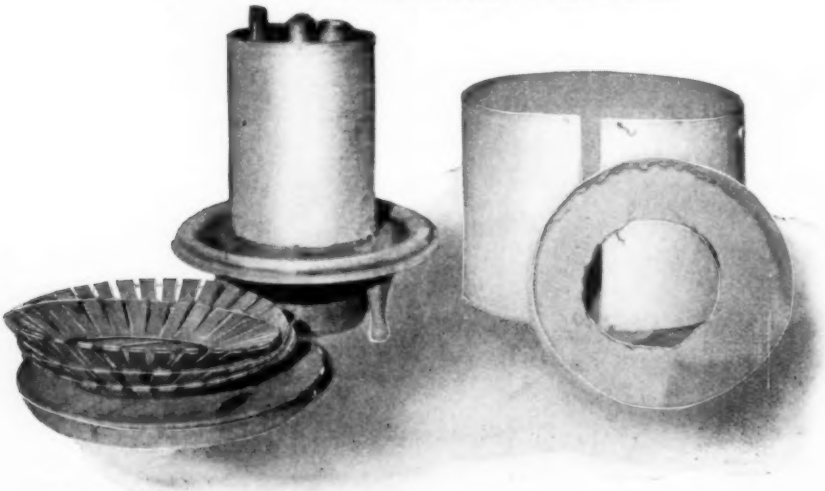


FIG. 3.—THE SIMPLICITY INCUBATOR WITH SHELVES ALSO TAKEN AWAY.

chance have we if F. H. Cyrenius and others are correct?

I thought over this subject a great deal until I read on page 280, May 1, Doolittle's advice to Mr. Hall, whose conditions in California are much the same as mine, only Mr. Hall's bees were about a month behind mine. Mr. Doolittle's advice to tier up and give room until the time for shaking, for comb-honey production, is just what I meant to follow for extracted-honey production, as comb honey is not in demand here, and extracted clover honey nets us from seven to nine cents. However, I should have divided my two brood-chambers by the Alexander plan to make double the number of colonies, as it does not do to let golden chances like these slip, and there is no law here limiting the number of out-apiaries one may own. Furthermore, I should either have extracted the honey-filled super and returned it, or have given another super if too busy to extract, so as to provide more and more room as the necessity for preventing swarming required.

Now for my query: If it is possible to prevent the bees from swarming by practically making them produce extracted honey, and then, when the flow arrives, make them transfer that same honey into comb-honey supers, how can any sensible bee-keeper have his bees in advance of his honey-flow? I may be wrong, but it seems to me that there is nothing at all in the theory of brood being raised too early, unless it is that there is an increased demand upon the stores. But if the business is really a business and not merely a hobby, surely there can be nothing against wholesale feeding if it pays and is a necessity. It seems to me that many of us want the easiest method, although the more thorough plan would pay far better.

Our honey-flow starts in the middle of December, when you have put your bees in the cellar, and when you are wrapping up yourselves—something that we never do here. Our climate is practically like that of Florida. I have orange and lemon trees flourishing in my orchard, and the nearest snow is 150 miles south of us on top of mountains 8000 feet high. Our local mountains, over 3000 feet high, are never snow-covered, even in the severe winter.

I wish we had A. I. Root out here, for he would encourage us in our fight for prohibition. We are greatly interested in the progress of the Anti-saloon League. I am a member of the New Zealand Alliance, which is the name of the prohibition society here.

Kihikihi, Waikato, N. Z.

[We do not think you need to be worried about your bees raising brood too early, Mr. F. H. Cyrenius lives in a locality where it is quite cold during the winter, during which the bees go into a long winter sleep or semi-hibernation, or a condition approximating hibernation. In such a locality, too early stimulation of bees in the spring by feeding or supplying artificial heat sometimes does more harm than good. We should judge that the conditions with you are very much the same as they are in Texas, and we are, therefore, referring your inquiry to Mr. Louis H. Scholl.

The conditions of locality vary so much that what would apply to one would not necessarily be applicable to another. There are places where, undoubtedly, too early brood-rearing brings on a force of bees too soon for the expected honey-flow; but in a climate like yours we hardly think you need to fear any thing of that kind. If you follow carefully the Doolittle plan we do not think you will experience very much difficulty.—ED.]

FEEDING THICK OR THIN SYRUP.

BY DR. BRUENNICH.

On page 396, July 1, I gave some observations to prove that, in the height of the season, the nightly decreases in weight of a colony on the scales do not result from an evaporation of water in the honey, but are to be ascribed to the augmented consumption of the nurse-bees, caused by the heightened organic combustion I further stated that the idea of ripening the honey from the nectar by mere evaporation was an unscientific legend, on the supposition that the thickening of the nectar takes place in the honey-sac of the nurse-bees, the superfluous water going into the blood, and being eliminated partly by the respiration and partly by the rectal gland.

This autumn, with my two colonies on scales I made some experiments for ascertaining the actual loss arising by feeding a thin or thick solution of sugar. The colony which I shall designate as A had a queen reared in 1908, while B had one reared in May, 1909. Both colonies were in equal-sized hives, occupying ten frames of approximately 139 square inches each. There was practically no brood. Colony A had 15.4 lbs. of honey, and B had 20 lbs.; both colonies had a good store of pollen.

I fed colony B first, giving the bees during the nights from the 2d to the 6th of September 17.2 lbs. of a 60-per-cent solution of sugar (specific weight 1.29, one gallon containing 6.45 lbs. of sugar). I fed colony A more intensively with a thin solution day and night. The bees were obliged to take from the 11th to the 13th of September 30 lbs. of a 52.6-per-cent solution (specific weight 1.245, one gallon containing 5.45 pounds of sugar). Besides this I gave the bees of this colony on the 16th of September 4.4 lbs. of a 56.5 per cent solution (specific weight 1.26, one gallon containing 5.95 pounds of sugar).

In the table (next page) I give the daily and nightly losses in weight of the two colonies. Before discussing the results given I may add my observations of an examination of both colonies the 22d of September. A had in three combs very little uncapped brood—from 60 to 75 square inches. B had capped brood in only one frame—about 60 square inches. The weather during the feeding was fine, and the bees brought in still more pol-

COLONY A.

	Losses during the day,		during the night.
		Together, 1.22 lbs.	
Sept. 1 to 10—			
" 11	I gave in the forenoon 7.35 lbs., 52.5%	1.08 lbs.	I gave in the evening 5.5 lbs. 0.66 lbs.
" 12	I gave at noon 6.83 lbs. (2.11 lbs.)	2.11 lbs.	1.48 lbs.
" 13	I gave at noon 6.77 lbs.	1.87 lbs.	I gave in the evening 3.64 lbs. 1.88 lbs.
" 14		1.87 lbs.	1.76 lbs.
" 15		1.21 lbs.	1.14 lbs.
" 16	I gave in the forenoon 4.40 lbs. (56.5%)	0.88 lbs.	0.93 lbs.
" 17		0.46 lbs.	0.24 lbs.
" 18		0.16 lbs.	0.09 lbs.
" 19		0.11 lbs.	0.11 lbs.

Sept. 20 the syrup seemed to be sufficiently thickened, the colony calmed, and the daily decreases were from that day about 0.11 lbs. in 24 hours.

COLONY B.

	Decreases during the day,		during the night.
Sept. 2	0	I gave in the evening 6 lbs. (60%).	0.48 lbs.
" 3	0.48 lbs.	I gave in the evening 5.7 lbs.	0.95 lbs.
" 4	0.48 lbs.	I gave in the evening 3.75 lbs.	0.66 lbs.
" 5	0.35 lbs.		0.24 lbs.
" 6	0.22 lbs.	I gave in the evening 1.75 lbs.	0.66 lbs.
" 7	1.10 lbs.		0.42 lbs.
" 8	0.48 lbs.		0.22 lbs.
" 9	0.29 lbs.		0.26 lbs.
" 10	0		0.33 lbs.
" 11	0		0.11 lbs.
" 12	0		0.11 lbs.
" 13	0.07 lbs.		0.07 lbs.

From this day the decreases were, on an average, .08 lbs. in 24 hours.

len. The result of speculative feeding in autumn is the same, I have observed, in all years. Our cold-blooded bees react very poorly, as a rule, on autumn feeding. It is true that, without feeding, there would be no brood at all in the hives; but still, the 1500 or 2000 young bees hatching from the brood started would not count very much in comparison with the 20,000 or 30,000 which go to make up a good colony in the winter. In regard to so small an amount of brood, I may say that the influence of it on the result of the sclaes is to be neglected, for colony A, with its uncapped brood, has only 5.03 lbs. more in its daily decreases in weight than colony B with its capped brood.

Let us now look at the conclusions that are to be deducted from these results. Colony A has received from Sept. 11 to Sept. 16 30.1 lbs. of a 52.5-per-cent syrup, making an increase of 15.8 lbs. of sugar; also 4.4 lbs. of a 56.2-per-cent syrup, or 2.47 lbs. of sugar. The total amount of *sugar* given to colony A, therefore, was 18.17 lbs. The increase in weight of the colony was, therefore, 34.5 lbs. (30.1+4.4) from the 11th to the 19th of September. This amount, less the total decrease in weight, is given in the above table 18.04 lbs., leaving 16.46 lbs. as the net increase. Normally this colony would have lost, if it had not been fed during the nine days, one pound, which we must add to the above weight; therefore we can actually reckon on an increase of 17.46 by the feeding. I will admit that the syrup in the hive was thickened to a consistency of about 75 per cent of sugar, so the real increase of sugar under this supposition is $17.46 \times .75 = 13.17$ lbs. As I gave 18.17 lbs. I therefore lost exactly 5 lbs. of sugar, or, in other words, 27.6 per cent.

Colony B received, from the 2d to the 6th of September, 17.2 lbs. of a 60-per-cent syrup; that is, 10.32 lbs. of sugar. The increase from Sept. 2 to Sept. 13 was 17.2 lbs. less 7.98 lbs. (the total loss as given in the above table), making 9.22 lbs. To this increase must be added $12 \times .08 = .96$ lbs. of loss which the hive would have suffered if I had done no feeding. By the feeding, therefore, we can say that the hive gained 10.18 lbs. of probably about 75-per-cent syrup. This would amount to about 7.63 lbs. of sugar. Therefore by feeding I lost, in this case, 2.69 lbs. of sugar, or 26 per cent in weight.

The result is somewhat striking. The question whether the food is better given thick or thin has often been discussed; but according to my experiments the difference is not very great. Of course, the colony fed the thin syrup loses more water than the one fed the thick syrup; but the real loss does not seem to be very different. For my part I prefer to give thick syrup chiefly, especially if the season is advanced. However, I think we ought to give considerable of the thin syrup for providing the bees with the necessary amount of water.

I added to all the syrup that I fed, 1 per cent of tartaric acid in order to facilitate the inversion of the cane sugar into dextrose and levulose. I have found that, with the acid, especially if the syrup is boiled a few minutes, there is less of a tendency to crystallize in the combs and on the bottom-board in the spring. Moreover, tartaric acid is at the same time a good disinfectant to put in the food.

The results above prove once more my theory which I recalled in the introduction, that the bringing-in of nectar or of syrup produces a remarkable increase in the combustion of food in the bodies of the bees—partly, perhaps, because all the vital functions of the bees are heightened, and also because of the amount of chemical energy necessary for the ripening of the honey or syrup.

Rheinau, Zurich, Switzerland.

THE SOURCE OF HONEY-DEW.

BY H. M. MOYER.

It is a disgrace to say that honey-dew honey is not honey. It is honey as well as white-clover honey, only of a poorer quality. Some even go so far as to call it "bug juice." It is not bug juice. I have been a reader of GLEANINGS, and a bee-keeper, about thirty-five years. During this time I have noticed honey-dew every three or five years, and I have watched it most carefully. It takes from six to eight days after the honey-dew is on the leaves for the lice to come. I think that the dew brings the insects, and not the insects the dew. When the honey-dew is on the leaves of the trees it is honey-dew; but when it is gathered and stored in the combs it is honey. The sweet substance in the white-clover blossom is called nectar; but when it is stored in the combs it is honey.

The older bee-keepers call honey-dew a gift of God, and I myself think it is a blessing when we have such a poor season as the past. If it had not been for the honey-dew this summer we would not have had over half a crop.

Bechtelsville, Pa.

[The above communication was submitted to Prof. H. A. Surface, State Zoologist of Pennsylvania, and President of the Pennsylvania State Bee-keepers' Association. He replied as follows:—ED.]

Before we can say what is honey and what is not honey we must first establish a fixed definition of the term "honey." We can do no better than to accept that which is given by the Board of Expert Chemists working in connection with the Pure-food Division of the United States Department of Agriculture, which demands universal approbation and support for the most excellent work of its chief, Dr. Wiley. These careful students and chemists have defined honey as "the natural saccharine exudations from nectaries or glands of plants, gathered, transformed, and stored by the honey-bee." Now, it is well known that honey-dew is chiefly the product of insects; and the form with which the bee-keeper has been plagued this year is not directly from plants, and, therefore, could not possibly agree with the definition of "honey" so properly established by the chemists of the Committee on Pure Food. If honey-dew is honey, then any food that is taken by the bee and stored in the comb is also honey, and it would be legal to sell not only the stuff from fruit juices, cider-mills, sorghum pulp, and sugar-cane and sugar beets, but also the refined products from these in the form of syrup. It is certain that sugar syrup fed to the bees and stored by them in the comb is much more palatable and wholesome as a product than is the honey-dew which they gather and store. This can not only be proven by a practical test of serving it on the table, especially to children, who are competent and critical judges, but also by attempting to winter bees on honey-dew exclusively, or upon sugar-syrup feeding. Both should likewise be ruled from the list of honey, as it would probably forever injure the legitimate trade to sell either stored sugar syrup or stored honey-dew as honey, such as we usually have in mind when we speak of this delicious product. It is my experience that a low grade of honey injures the sale for that of better quality, and I am well convinced that a ton of honey-dew honey scattered through almost any city would seriously injure the sale of genuine honey in that city for the coming year.

There should be no comparison between the so-called honey-dew honey and white-clover honey, for the reason that the latter conforms to the definition in coming from the nectar of the flower, while the former disagrees entirely, and is a product of an insect. Honey-dew in this State is never found excepting on plants that are infested with certain scale insects, plant lice, or similar insects. It is true that it will be seen on the lower leaves of a tree before the insects get there; but this is because they often leave the trees by flying through the air and commence to feed on the tender new leaves of the upper part and drop their sweet secretions on the leaves below. Later they drop to the leaves below or crawl down the tree, and may be seen on the lower leaves. This does not mean that honey-dew was on the leaves before the insects were there.

Honey-dew attracts ants, wasps, flies, bees, and other insects that feed on sweets; but the plant-lice do not feed on the honey-dew nor on sweets, as they draw all their living from the sap of the trees or plants that are infested. No one has ever seen plant-lice feeding on the sweet liquid called honey-dew; but, on the other hand, we have frequently observed this liquid coming from the cornicles or honey-tubes of plant-lice, as well as from the vent or digestive tract. No one can watch plant-lice during the summer without seeing the honey-dew appear first in small globules, and then increase to larger drops on the cornicles or honey-tubes, especially when ants are stroking the plant-lice with their antennæ. There can be no possible doubt of the source of this liquid.

As to whether the honey-dew is a benefit to the bee-keeper depends upon how he winters his bees, and upon locality. If the bees can be wintered on their summer stands, or where they have flight as frequently as they need it, and the locality and season are such that they can fly frequently, say once every two or three weeks, they will winter all right on honey-dew; but if they are to be put into a cellar, or otherwise kept from flying for six weeks or two months, they will doubtless perish with dysentery. Honey-dew makes far more waste material to be voided from the system than any other food that the bees can take, and it is known that this voiding is done only when in flight. This explains why bees must be given an opportunity for flight if they are forced to feed on honey-dew. If such opportunity be not given, it is better to feed the bees abundantly as soon as possible with sugar syrup, after having removed the honey-dew, and save this for stimulative feeding next spring.

At the annual meeting of the Pennsylvania State Bee-keepers' Association, held in Lebanon, Pa., the general sentiment was that the honey-dew this year was a great nuisance, and the bee-keepers would rather be without it. There was no expression to the contrary.

Harrisburg, Pa.

HEADS OF GRAIN

FROM DIFFERENT FIELDS

PART OF THE HONEY SOURED WHILE THE REST DID NOT.

I recently had some honey sour that was gathered last year. It was produced in solid, sealed, virgin combs. It was strained into a 500-lb. tank, then drawn off into three, five, ten, and sixty-pound cans. Some of it soured, and some did not. Why did some of it sour and not the rest? I had it in new cans in a dry and comparatively warm place. What can I do with it? D. H. MORRIS.

Springfield, O., Oct. 25.

[Not *all* honey sealed in the combs is thoroughly ripened. Bees apparently, in the rush of the season, will seal some honey prematurely. But we may say that, as a rule, all sealed honey is thoroughly ripened.

To answer your question, we might suggest that some of the honey to which you refer was not thoroughly ripened. Had you left it, after extracting, for a longer period in the 500-lb. tank, where the air could get to it, you probably would have no trouble from its souring. In some climates it is unwise to seal extracted honey up too soon after it is taken from the hive, unless it is heated to about 140 degrees. In our own locality we know that first-class sealed clover honey, if shut up tight and confined in the supers for some months, is in danger of souring before spring. We have found it necessary to pile the supers crisscross in a warm room so that the air may circulate through them. Honey that has been aired this way probably ripens still further—that is to say, the process of inversion becomes more complete, even after it has been sealed up in the combs; for we are now told that partly inverted honey will continue to invert if stored in open tanks covered with coarse material like cheesecloth or wire cloth. We do not know what to do with soured honey except to make honey vinegar of it. If it has only a slight suggestion of sourness heating to 140 or 150 may arrest the action.—ED.]

WHAT CAUSED THE FIGHTING AFTER FEEDING?

About the 7th of October I began feeding back extracted honey for stimulative puposes, giving half a pint of thin honey to a hive each evening. After feeding is over in the evening, and the bees have quit flying, they will begin fighting among themselves. There are seven or eight colonies which do this. Each colony will kill bees in its own hive, and I have found a great many dead bees. In consequence of this I had to discontinue feeding. Can you tell me what is the matter? Can you also tell me whether there is any danger of bees killing their queens through late fall feeding or not? I was told they would.

New Plymouth, Ida. A SUBSCRIBER.

[We question very much whether there is ever any fighting among any bees of a colony unless it is between individuals from two *different* queens or colonies. If any of our readers are able to offer any other explanation, or furnish evidence to show that the bees of one mother in one colony will, all on a sudden, begin to fight each other to the point of extermination, when there has been no robbing, we should be glad to hear from such.

In the case above cited, it is somewhat significant that seven different colonies should begin fighting right after feeding. We can not get away from the conviction that those bees, by reason of the feeding, became excited, got to robbing, mixed more or less at the different entrances, then when night came on discovered that there were many strangers in each hive, and began to fight. A bunch of seven or eight colonies might get so excited over robbing that they would put up no defense at their individual entrances. When night would come on, there would be no flying, and the strange bees would fight each other. We believe that, if our correspondent would investigate a little further, he would find after all that robbing was at the bottom of the whole trouble.—ED.]

A STRANGE LOSS OF BEES IN AUGUST.

I should like some information as to the cause of the mysterious losses which nearly every bee-keeper in this section has had this fall. On the 21st of August I examined my 22 hives and all seemed to be all right, most of them working on the wild sweet clover. I went away for a week; and when I came home I found half of my hives deserted, and in six of them the millers had wrought great havoc. Since then I have lost two more, leaving only nine colonies, and some of these are not as strong as they should be. They are Italian hybrids, generally inclined to be cross; but this year it seems as though they were too stupid to sting, no matter how handled.

I have talked with several other bee-men, and all have different opinions as to the cause; but all claim a loss of from 50 to 99 per cent. One man has only one colony left out of 78. Another lost 21—all he had. Some blame the spraying of the fruit-trees; but I do not think that is the cause or we should have lost early before swarming time instead of so late.

I have seen quite a number of hornets around and inside of most of my hives, and I wonder if that has any thing to do with the bees leaving the hive. I know they fight, and generally the hornet kills the bee in the battle.

Merritton, Ont., Sept. 18. JOHN J. FAWELL.

[We are unable to offer any solution of the trouble. It is possible that the bees gathered some poisoned nectar during the spraying time, stored it in the combs, and later on when they came to use it, it killed them. Perhaps some of our Canadian friends in the vicinity can throw some light on it.—ED.]

POUNDING ON THE HIVE TO CAUSE THE BEES TO FILL UP WITH HONEY SO THAT THEY START BROOD-REARING.

I am greatly interested in the subject of stimulating bees by shaking according to the plans which I have seen mentioned several times; but it seems to me that all this shaking, whether for stimulating or preventing swarming, is a lot of work. However, I believe that, when bees have a lot of stores which we want them to convert into brood, shaking will do a great deal of good. Now, instead of shaking, how would it do to go to every colony, say three or four times in a week, and, after blowing smoke in at the entrance, drum for a short time on the sides of the brood-nest with a suitable stick or club? This will cause the bees to uncap the honey all right, and in the general excitement, and afterward, the queen will be highly fed and stimulated to extra egg-production. This will be less work, and ought to do as much good as an equal number of shakings if not more.

At the beginning of each year our colonies always have their brood-nests full of honey; but at the same time they are weak in bees. How to remove the honey and at the same time strengthen the colony in time for the harvest without too much extra work is a problem that I am trying to solve; and I am hoping that the above method will aid me in solving it.

Jamaica, B. W. I., May 19. R. C. HOLLE.

[The plan you outline might work in a hot climate such as you have; but we would not advise it in the northern sections of this country. Ordinarily, bees will raise brood as fast as they can take care of it; and very often they will attempt to raise *more*.

Taking it all in all, we are of the opinion that this pounding and smoking would do more harm than good. We suggest that you try it out and report.—ED.]

MAKING A DEAD-AIR SPACE AROUND THE COMBS IN A DANZENBAKER HIVE.

For the last three years I have been using the Danzenbaker hive exclusively, and have tried various ways of wintering the bees. In this hive the sides are single thickness, while the ends are double. This winter I expect to reduce the brood-chamber from ten to eight frames by taking out the follower-board and placing two boards, 17 x 8¼, at one end, and 8¾ at the other, and ⅞ inch thick, leaving one frame and one empty comb on each side of the hive. This will give me an air-space of 1⅜ inches broken by an empty comb, which is a non-conductor of heat. I expect to use also a thin honey-board over the top of the hive, and the bees will naturally glue this board to the two division-boards as well as to the hive ends. The hive having been previously glued on the outer boards, this will make practically a dead-air space, as the division-boards fit tight to the bottom-board. On top of this honey-board I expect to place an empty super and fill it with the regulation cushion or mats. This arrangement also gives the bees room enough to crawl over the top of the frames, which is impossible in any other arrangement without using sticks of some kind to hold up the enamel cloth. I am somewhat prejudiced against enamel cloth, for the simple reason that the

hives sweat more or less, and I have often found moldy combs as a result. What do you think of this arrangement?

Wheeling, W. Va., Sept. 2. W. O. COOPER.

[The plan that you describe is the one employed by most users of the Danzenbaker hive. As you say, in effect, it makes a double-walled hive.—ED.]

A SUDDEN FAILURE IN UNITING AFTER HAVING HAD GOOD SUCCESS.

Last fall I wrote you what fine luck I had in combining weak colonies. Out of 30 such trials there was not a failure, and nearly all of them just "as easy." This year I have no honey, not many swarms, and so tried it only once. Now, with the same man, same plan, same yard, and same stock of bees, the result was a horrible massacre—not one little bee of the weaker colony escaped. "The ways of a woman are past finding out," and bees are mostly women, are they not?

Jerseyville, Ill. U. S. DONIS.

[The temperament of bees varies according to the day and season. There are times when they are very docile, while at other times they are very cross and nervous. Colonies of gentle Italians can be united under most conditions without quarreling. Bees that can be united under one set of conditions without trouble, might, under another set, slaughter each other indiscriminately. Your experience, therefore, is not unusual.—ED.]

THE SUPER THE PLACE FOR COMB-BUILDING IN THE BROOD-NEST.

On page 594 Mr. Gibson voices a truth when he says that full sheets of foundation are a necessity to a beekeeper. He also advises their use in the super. I go a little further, and say that full sheets should never be drawn out in the brood-chamber under any circumstances. Further, they should not be drawn out in the super until the honey-flow is on in earnest.

Every time I extract I place two frames with full sheets in the super, one on each side, filling the center with drawn-out combs. This gives me two new combs to each at each extracting. When a swarm requires a hive I place six good worker combs in it, and two starters, one on each side—never full sheets. Later I remove these to the super.

If you hive a swarm on full sheets it will break some of them down on account of the weight. I repeat, I have found that the only time to build comb is during the honey-flow and in the super.

Los Angeles, Cal. T. ARCHIBALD.

CAN BEES FLY BACKWARD ON THE SAME PLANE?

On page 380, June 15, in reply to W. H. Sterne's inquiry, the editor expressed the opinion that bees could not fly backward on a horizontal line. I opened a hive to-day, and a number of bees flew out; and one, particularly inquisitive, with wings vibrating rapidly, seemed much interested in an empty comb I held. I noticed that it moved backward when I moved this toward it, and, remembering the above article, I moved the comb back and forth several times, keeping it on the level plane, and the bee kept about two inches distant, opposite a certain spot, the whole time, till it at last alighted. S. C. RHODES.

Auckland, New Zealand.

[We now have in hand enough testimony to prove conclusively that bees can fly backward in the same as well as on a descending plane. We can now consider the question settled.—ED.]

OIL-CLOTH OR SEALED COVERS PREFERRED.

I have never kept a great number of colonies of bees, but I have always wintered them out of doors. I use ten-frame Langstroth hives. I do not use sealed covers, but I use oil-cloth, which is about the same thing. As I have had better success than my neighbors I will give my method.

As my hives are all single-walled I take out four frames that are the lightest in honey. If there is not 25 or 30 pounds of honey I see that there is by feeding.

To begin with I start a common eight-penny nail about three inches from the outside wall that is to keep the division-board from crowding against the frames. Then I crowd the six frames over against the division-board, and do the same thing on the other side. I use buckwheat chaff or hay chaff. It is better than leaves for packing. After I pack on each side of the two division-boards I take three little sticks about ¾ inch thick and 10 long, and lay these on top of the frames, all spaced the same; then lay oil-cloth on top of that. I then take an empty super and put on and fill it with chaff. I can do this quicker than it takes to tell it.

In 1907 I packed 15 colonies the same as before, except the oil-cloth. I used bran-sacking instead. I had very poor success. I lost 6 out of the 15. I had 20 packed the other way, and lost one. I will take the oil-cloth or sealed covers. MINOTT C. YOUNG.

Rutland, Vt.

JIGGERS CAUSE SORES ON WHITE-NOSED HORSES, AND NOT ALSIKE CLOVER.

For some time I have noticed accounts in GLEANINGS of animals being poisoned or breaking out into sores about the head and hocks through eating alsike clover, and more particularly horses and mules with white faces. I think these sores may be occasioned by a small insect, the same as or similar to what appears here at the commencement of and continuing through the rainy season called (pronounced in Spanish "byvoieen") or "jigger" of the West Indies. While it is scattered through the herbage, it particularly inhabits certain flowers. It is extremely small, invisible to the naked eye except when gorged with blood, when it becomes bright red. It bores into the skin, and there breeds, forming sores and causing the hair to fall off, especially with white animals, for the reason, I suppose, that white skins are thinner than dark ones; hence the Indians here suffer but little from them; but if they get a footing on our legs they bore into the skin and produce an itching, simply unbearable without scratching, when a sore quickly follows, and still worse itching. The remedy is to rub in alcohol or diluted ammonia or carbolic acid

Chinipas, Mex., Oct. 13. FRANK M. BREACH.

WINTERING BEES OUTDOORS PACKED IN CHAFF WITH A TIN TUBE TO ALLOW THE MOISTURE TO ESCAPE.

Mr. Root:—You asked for experiences in regard to absorbents and non-absorbents in wintering bees. We have used for the last five years, with great success, the following arrangements:

First, have the bees strong before going into winter quarters. If in single-walled hives, use about four inches of chaff packed on four sides and bottom part. Then cover with a Hill device; next an oil-cloth or some material not porous. Then put on a chaff cushion. Through the oil-cloth and cushion we insert a small tin tube about the size of a leadpencil, and about 9 inches long, to carry out the dampness and foul air.

Some would think the tube would carry out too much heat in cold and frosty weather; but we find that in cold weather the tube regulates its size by the moisture condensing and freezing at the upper end of the tube. Sometimes the hole is no larger than a pinhead; then when we have a mild spell the frost in the tube melts and passes away, and gives the bees more ventilation when required. We find this gives us better results than sealed covers, with healthier and stronger colonies, and with very little dysentery.

St. George, Ont. GEORGE C. HUMPHREY.

A NEW WAY OF USING THE FLOUR METHOD FOR INTRODUCING QUEENS.

At one time last summer I had quite a surplus of virgin queens that were about six days old; and, wishing to introduce them as quickly as possible, I decided to try the flour method. I took the virgins, one at a time, and threw them into a tin baking-powder can half full of flour, and shut them in. As six-day old virgins are very active they tried to fly around in the box, and in less than one minute they were so completely covered with flour that they could not fly at all. While in this condition I picked them up on the end of a small twig and ran them in at the entrance of the nucleus-boxes. Forty virgins were thus treated, and about 75 per cent of them were successfully introduced. At the same time, three laying queens were successfully introduced to full colonies by the same plan.

Medina, O. MELL PRITCHARD.

[Our readers will remember that Mr. Pritchard is the one who had charge of our north yard, and reared nearly three thousand queens.—ED.]

SHORT SPLINTS SATISFACTORY.

I used half-length wood splints this year. They worked all right, and were not gnawed out.

Hudson, Mich. E. E. SMITH.

OUR HOMES

BY A. I. ROOT.

There shall be wailing and gnashing of teeth.—MATT. 13:50.

My talk this morning, or at least my start-out, was suggested by a sermon preached by our Congregational pastor, J. E. Kirbye, D. D., on Nov. 7. The speaker said in his sermon that when he was a child he got hold of the idea, more or less common at that time, that at some time in the great future all mankind, from the beginning of the world up, were to be called up from their graves and form a great procession; and this procession was to march past a great white throne where God sat in judgment and judged this throng of humanity. A part were to be assigned to heaven, and the other part to eternal torment. I think he added that there is nothing in the whole Bible to furnish ground for such belief.

I had to smile while he was speaking about it, because it agreed so exactly with my early ideas and early teachings; and my childhood dates quite a good many years prior to that of my pastor. Well, as that particular belief has been gradually dropped by at least a good many Christian people, I rather think mankind in general has been coming to the conclusion that we do not need to wait until death, or, say, a long time after death, before we can experience the joys of heaven. The real, earnest, hard-working Christian finds heaven here on earth. If you do not find it as a reward after your faithful and energetic work, there is something wrong somewhere.

Now, my convictions have been growing stronger and stronger as I grow older, that heaven commences here on earth; and I believe that *that* is the experience of most of those who are working unselfishly for the good of humanity.

Now, Dr. Kirbye did not exactly say so, but I gathered from his talk that he believed that one might find *hell* as well as heaven here on earth. On page 686, Nov. 1st issue, friend Gault furnished us a bright suggestion to the effect that those who deliberately *choose* hell, instead of heaven, "carry their own brimstone along with them;" and the more I think of it the more I am convinced that there is a great truth right there. Men suffer the torments of hell here on earth because of their evil deeds; and these torments are often so great that they commit suicide in the effort to escape such torments. Whether they *do* escape *any thing* by suicide is a question that, perhaps, we can not solve. The man who, in a fit of anger, shoots his wife and children, and (as soon as he begins to recognize his awful crime) turns his revolver upon himself, illustrates the truth of what I have been saying.

Dr. Kirbye called our attention to the fact that the "wailing and gnashing of teeth" is going on all around us, but perhaps we have not noticed it. He said that when mankind had gradually risen up to the "higher ground," where they decided that human slavery was a sin against God as well as against humanity, there was wailing and gnashing of teeth before men would give up their slaves. When the general government decided that lotteries were also a sin against God and mankind, and attempted to put a stop to it by righteous laws, there was more wailing and gnashing of teeth. And just think what we had, and for that matter are still having, to keep the demon away from our shores. Just *now* there is wailing and gnashing of teeth among the liquor forces because their whole crew, like the slaveholders and the Louisiana Lottery people, are to be crowded off the face of the earth. See what comes from one of the liquor periodicals on page 719.

Well, friends, I am now coming to the point of this Home paper—the banishing of the saloon. It has resulted in unearthing something more terrible, if possible, than intemperance and every thing else that follows along in its wake. What I allude to is the white-slave trade. Something happened a few months ago in our nearby city of Cleveland that seems to have started the war; and the general government of this nation has appointed Edwin W. Sims, U. S. District Attorney, to investigate. From a little pamphlet just sent me I clip the following:

SMASHING THE WHITE-SLAVE TRADE.

You know that throughout the United States a "white-slave traffic" of appalling proportions was recently unearthed.

It is widespread, even international. It proved so appalling, and the public was so unaware of the existence of the predatory monster, that the *Woman's World* told its 2,000,000 readers, in two tremendous articles by United States District Attorney Sims, of Chicago, the facts—warned them, so that they and the country in general might be forearmed.

Thus was it revealed to the people that there is a white-slave traffic.

The disgraceful facts are these:

Some 65,000 daughters of American homes, and 15,000 alien girls, are the prey each year of procurers in this traffic, according to authoritative estimates. Even marriage is used as one of the diabolical methods of capturing girlhood and young womanhood and "breaking them in" to a life of shame.

They are hunted, trapped in a thousand ways; trapped, wing-broken, sold—sold for less than hogs!—and held in white slavery worse than death.

The daughters of all of us, our sisters, even our wives, are looked upon as prey for the white-slave traffic.

In the March number of the *Woman's World* was published the article which marked the beginning throughout the United States of an actual *war* of *extermination*. It was by Assistant United States District Attorney Harry A. Parkin, "Practical Means of Protecting Our Girls."

The pamphlet from which the above was taken goes on to tell how the different States of our Union are taking hold of the matter and pushing it forward. Attorney Sims gives quite a number of illustrations in the pamphlet I have mentioned, of what he has unearthed in regard to this awful traffic; and I have selected the following from among them as just one illustration:

Whether these hunters of the innocent ply their awful calling at home or abroad, their methods are much the same—with the exception that the foreign girl is more hopelessly at their mercy. Let me take the case of a little Italian peasant girl who helped her father till the soil in the vineyards and fields near Naples. Like most of the others taken in the raids,

she stoutly maintained that she had been in this country more than three years, and that she was in a life of shame from choice, and not through the criminal act of any person. When she was brought into what the sensational newspapers would call the "sweat-box" it was clear that she was in a state of abject terror. Soon, however, Assistant United States District Attorney Parkin, having charge of the examination, convinced her that he and his associates were her friends and protectors, and that their purpose was to punish those who had profited by her ruin and to send her back to her little Italian home with all her expenses paid; that she was under the protection of the United States, and was as safe as if the king of Italy would take her under his royal care and pledge his word that her enemies should not have revenge upon her.

Then she broke down, and with pitiful sobs related her awful narrative. That every word of it was true no one could doubt who saw her as she told it. Briefly this is her story: A "fine lady" who wore beautiful clothes came to her where she lived with her parents, made friends with her, told her she was uncommonly pretty (the truth, by the way), and professed a great interest in her. Such flattering attentions from an American lady who wore clothes as fine as those of the Italian nobility could have but one effect on the mind of this simple little peasant girl, and on her still simpler parents. Their heads were completely turned, and they regarded the "American lady" with almost adoration.

Very shrewdly the woman did not attempt to bring the little girl back with her, but held out hope that some day a letter might come with money for her passage to America. Once there she would become the companion of her American friend, and they would have great times together.

Of course, in due time the money came—and the $100 was a most substantial pledge to the parents of the wealth and generosity of the "American lady." Unhesitatingly she was prepared for the voyage which was to take her to the land of happiness and good fortune. According to the arrangements made by letter the girl was met at New York by two "friends" of her benefactress who attended to her entrance papers and took her in charge. These "friends" were two of the most brutal of all the white-slave drivers who are in the traffic. At this time she was about sixteen years old, innocent, and rarely attractive for a girl of her class, having the large handsome eyes, the black hair, and the rich olive skin of a typical Italian.

Where these two men took her she did not know—but by the most violent and brutal means they quickly accomplished her ruin. For a week she was subjected to unspeakable treatment, and made to feel that her degradation was complete and final.

And here let it be said that the breaking of the spirit, the crushing of all hope for any future save that of shame is always a part of the initiation of a white slave. Then the girl was shipped on to Chicago, where she was disposed of to the keeper of an Italian dive of the vilest type. On her entrance here she was furnished with gaudy dresses and wearing apparel for which the keeper of the place charged her $600. As is the case with all new white slaves she was not allowed to have any clothing which she could wear upon the street.

Her one object in life was to escape from the den in which she was held a prisoner. To "pay out" seemed the surest way; and at length, from her wages of shame, she was able to cancel the $600 account. Then she asked for her street clothing and her release—only to be told that she had incurred other expenses to the amount of $400.

Her Italian blood took fire at this, and she made a dash for liberty. But she was not quick enough, and the hand of the oppressor was upon her. In the wild scene that followed she was slashed with a razor, one gash straight through her right eye, one across her cheek, and another slitting her ear. Then she was given medical attention, and the wounds gradually healed; but her face was horribly mutilated; her right eye is always open, and to look upon her is to shudder.

When the raids began she was secreted, and arrangements made to ship her to a dive in the mining regions of the west. Fortunately, however, a few hours before she was to start upon her journey the United States marshals raided the place and captured her as well as her keepers. To add to the horror of her situation she was soon to become a mother. The awful thought in her mind, however, was to escape from assassination at the hands of the murderous gang which oppressed her.

One recital of this kind is enough, although instances by the score might be cited which differ only in detail and degree.

Now, friends, when the government of the United States, assisted by the legislatures of the different States, succeeds in breaking up this traffic so skillfully intrenched, there will be more "wailing and gnashing of teeth." Yes, there will be trouble—probably bloodshed and murder; and I hope the movement will have the indorsement of every good man and woman—certainly of every father and mother in the land; for the assistance of such is needed to wipe out this awful shame on our nation and our civilization. The pickpocket is a criminal and should be promptly and severely punished. The highwayman who knocks people down in order to get their pocketbooks is a villain, and does not deserve to live unless he can be soundly converted and made over again. Some two or three years ago I told you of a fellow who knocked down and robbed a lady schoolteacher. She had just finished her term and drawn her pay. By the way, if there is any class of people in this whole wide world who deserve our reverence and need our protection it is the women *teachers* who are spending their lives in trying to make our boys and girls grow up to be good pure men and women. Well, this fiend in human form, probably under the influence of liquor, brutally knocks down this refined and intelligent woman, and took from her by force her hard earnings, and left her there, helpless and bleeding. I remember wondering whether the city of Fostoria, O., would make up her loss or not; but they certainly ought to be ashamed of themselves besides, for permitting such things to go on inside of their corporation. Of course the city (for it is quite a good-sized one at least) was full of saloons; and within the past week my heart has sunk within me when I read in the papers that Fostoria had gone wet *again*.

Well, this fellow who knocked this lady down and got her money was not as bad a man as the "procurers" who have an organized system with men and boys to waylay our little girls. The word "hell" is an awful one. I have sometimes thought I would not use it, but choose some substitute that would amount to about the same thing; but the recital of the infamy of the capture of that little Italian girl makes me feel that we have not only a need of *heaven* here on earth but we need hell also; and the quicker we can get these villians into *torments* of *some kind* the better. Let us work, and rejoice to *see* the wailing and gnashing of teeth.

Years ago, when I was a boy, and away from home I became pretty well acquainted with a saloon-keeper. Perhaps I might as well tell you that I used to go around there every day and get my glass of beer. Well, this saloon-keeper, away back at that early date, unfolded to me a plan for building up a prosperous (?) business. He was going to send to the city and get a "bar-maid." He said it would cost quite a little to support her, but he said he had some rich customers who would help defray this expense, and she would "draw" a great lot of business. Yes, no doubt she *would* "draw" a lot of custom-

ers; but those customers would be our boys, and they would not only learn to drink beer, but to do things a thousand times worse. May God help us in our efforts to banish this whole iniquitous business from our great cities. My opinion is that this whole thing has been connected with the saloon. Without drink to stupefy the conscience of both victim and victimizers the traffic could not go on. May God be praised that the government of our great nation has taken hold of the matter, and has been able to secure the services of such good and faithful men as Attorney Sims and Assistant District Attorney Harry A. Parkin.

HEALTH NOTES

DEAFNESS, COLD-WATER CURE, ETC.

After my attack of the grip fever on my return from Florida last spring my deafness was very much worse. I consulted an expert, and after a few questions he told me that my trouble was caused mainly by my recent sickness, and that in a little time, when I had fully recovered my strength and vigor, I would be able to hear just as well as before the attack. He did not prescribe any medicine nor recommend any particular treatment; and, by the way, he has not sent in any bill as yet. But I would a hundred times rather pay a physician for giving me advice and telling me I did not need any drugs or medicine than to write out a prescription for me, to be taken to the drugstore.

Well, notwithstanding this expert advice I kept reading the advertisements in the various periodicals for the cures for deafness. One in particular attracted my attention, from a doctor—at least he *called* himself a doctor. He begged the privilege of sending to any one a month's treatment free of charge. So I wrote him, describing briefly my case. In response I got quite a box of medicine and apparatus; and I must give him credit by saying that most of them were sensible, and seemed well adapted to the purpose. The most I objected to was that the correspondence was all printed letters *purporting* to be real personal letters. The *Sunday School Times* says it is *always* wrong to use deception. Oh how I wish the great business world could grasp this magnificent truth!

Well, I finally became disgusted with his printed correspondence, and said if there was any *real* doctor at the back of their institution for the cure of deafness I should like to hear from him. This brought out a real letter, although a brief one. Now, his box of medicines and instruments did not help my deafness a particle, so far as I could see; but one single paragraph in his instructions *was* worth something. It read something like this:

"Be sure to wash your face and neck and ears with cold water every morning—say with water just as it comes from the pump or well. After a thorough cleansing, using plenty of cold water, especially around the ears, then take a rough towel and rub briskly around the neck and ears and head until you get up a brisk circulation. Do this at least once every day, and two or three times a day would be better. In order to restore to health any part of the body that seems to be failing, this cold water and brisk rubbing will often do more good than any medicine or any kind of treatment."

The above brief sentences were worth more to me than any thing I had ever gotten hold of for my deafness. I do not think I read that part of the leaflet until I had had the remedies for nearly a month; but I considered this simple suggestion worth so much that I sent him $5.00, and considered it a good investment. As I said before, his medicines and implements did not seem to do me any good—at least I was no better after a month's treatment. But after the cold-water massage, as outlined above, my hearing began to improve. After I had used it for about two weeks I was surprised to find one morning, when I opened my eyes, that I could hear the ticking of our electric clock very distinctly. When I recently visited friend Terry I gave him the above in substance, when he said right off, "Why, Mr. Root, you have got right square on to the great truth that I have been laboring so hard to teach; but you want to apply it to your *whole body* instead of just your head, neck, and ears." Then he took us down cellar and showed us his cheap home-made arrangement for taking a cold-water bath. Right near his furnace in the cellar for warming the house there is a depression in the cement bottom, and in this depression is an outlet for the water into a tile drain. While he has a modern bath-room and bath-tub upstairs, he prefers to take his cold-water morning bath down by the furnace. All that is needed in the way of a bath-tub is a good-sized wooden tub. He pumps this full of water right from the bottom of the well, close by the house. By using this water right from the well he gets water, winter and summer, of about the the same temperature—I think about 50—he really prefers it as cold as that.*

When I first began washing my head and ears with water right out of the cistern, there was quite a temptation to take a dipperful of warm water out of the reservoir right close by the sink; but after a few weeks' use of the cold water I greatly prefer it; in fact, I should feel lost just now if I did not have my cold-water wash every morning; and Mr. Terry says he enjoys this cold bath so much that he looks forward with pleasure to the time when he can take it.

Now, you might say this is all right for a

* T. B. Terry, in one of his writings, has said something like this: "You can, by drinking a cup of strong coffee, get up a certain kind of enthusiasm and energy for a short time; but after the stimulus of the coffee has passed away you are in a worse condition for any kind of work than before you took the coffee. Now, you can get up a much better kind of energy and enthusiasm by cold-water baths, such as I have described; and this kind of stimulus is never followed by a reaction. It not only pulls you up to your best condition for work, but it *keeps* you there."

big strong man full of life and energy and good blood, like T. B. Terry; but he has talked so much about it that both his wife and daughter have recently adopted the cold-water bath down cellar, and they now enjoy it fully as much as he does. Since Mr. Terry has been teaching us so vehemently cold-water bathing I have met and heard from quite a number of people who say it has been of more benefit to their health than any thing else they ever got hold of. If you wash off in this way every day, no soap will be needed; and I am fully persuaded that soap is a hindrance instead of a benefit to health unless it is washed from the body with clean water after having used the soapy water. Just think of it! you go to the drugstore and buy witch-hazel, and no end of liniments and pain-killers. The directions are to "apply with brisk rubbing." Now, this "brisk rubbing" is what gives relief and performs the cure; and cold water right from the well or cistern, that costs nothing, is infinitely better than all the liniments and pain-killers in the world. Why, when Mrs. Root and I had the fever, the doctors and nurses sent to the drugstore for the highest-priced alcohol (no denatured alcohol would answer; we paid the tax on it that was imposed, so they claim, to prevent inebriates from getting it), and then gave us an alcohol bath. I submitted just once; but I do not think I ever will again. If I must die a little *sooner* because they did not rub me off with some vile alcohol, then let me die sooner.

Down in Florida, when we were building our house there was a tub out under the pump, made by sawing off a third of a large-sized kerosene-barrel. I sawed it off in that way so as to have one shallow tub for giving water to the chickens while I had the other deeper tub under the pump. Well, one night after a sweaty day's work I went out to that tub to take a wash. The water (almost as soft as rain water) seemed so cooling and delicious I finally removed my clothing and got into the tub. As I am not a very large man I found it an easy matter to get clear under the water all except my head and ears. Of course, it was after dark; but happening to hear some voices of people coming in a buggy I decided it would be cheaper to get into the tub under the water than to try to run back to the house. Now, while I was under that beautiful cool soft water, right from the well, I gave myself a good scrubbing all over. Then with a coarse towel I rubbed briskly every part of my anatomy until I was not only clean, but had the blood circulating in a way that it had not done before for quite a spell.

Now, do not any of you say any more that you can not take a bath because you have not modern facilities. A tub big enough to hold you, and a towel with which to go through "the closing act," are all the facilities needed. By the way, T. B. Terry remarked that in the summer time he takes his cold-water bath outdoors inside of a clump of evergreens planted so as to give a secluded spot for just such purposes.

Now, friends, I have heard from quite a lot of you who are proposing to keep company with Terry, Fletcher, and myself in living to be a hundred years old. If you are really in earnest about it, go and get yourself a tub big enough to hold you, and then "climb into the band wagon" and go along with the rest of us.

Before closing, here is another item along the same line. You have probably all heard of curing cold feet by wading in the dewy grass early in the morning, barefooted of course. You have perhaps discovered, as I have, that you often catch a severe cold by allowing your feet to become damp and cold at the same time. Almost every fall I have a trouble with sore throat—that is, while I am up here in the North—unless I am very careful to wear overshoes as soon as the weather becomes chilly. Now, it would look quite natural, I suppose, that all of said wading in the wet grass in the early morning would be sure to make one "catch cold;" but not so, however. You can scamper around in the wet grass for fifteen or twenty minutes, and then rub off your feet briskly with a rough towel (just exactly in the way that I "massage" my neck and ears); and instead of causing you to take cold, your feet will be much more likely to keep warm all day, without extra covering either. I do not suppose it would answer to stand still when out in the wet grass; but the cleansing power of the cold water, accompanied by brisk exercise, seems to have the effect, as Terry expresses it, of bringing the warm blood to the surface and to send it galloping all through the system. If you are troubled with corns, this wading in the grass is worth more to you than any thing else in the world. If I remember correctly, it is part of the program that father Kneipp uses in his celebrated sanitarium in the old country.*

*I find, on consulting Pastor Kneipp's book, "My Water Cure," that he not only prescribes cold-water baths, but even walking barefoot in soft newly fallen snow. Let me quote from the book:

Quite recently a young girl came to me complaining of violent toothache. "If you walk five minutes in the fresh-fallen snow, your toothache will speedily disappear," I said to her. She ran out into the garden and did so, whence she returned some ten minutes later with the joyful announcement that her toothache was completely gone.

BUILDING UP THE KINGDOM OF GOD ON EARTH.

The following is an extract from an old attorney and judge. As he is an old acquaintance of my son-in-law, Mr. Boyden, the latter sent him a copy of our journal. After he looked it over he returned the following "verdict:"

Mr. A. I. Boyden:—I read the parts of the papers edited by Mr. A. I. Root with much interest. They show that a Christian, determined to do the Master's work, can always find ways and means to accomplish something toward building the kingdom of God in the earth. I am glad I met you. Remember me to all my friends. ERVIN PALMER.

Detroit, Mich., Nov. 2, 1909.

POULTRY DEPARTMENT

BY A. I. ROOT.

THE "NOVICE"* "SIMPLICITY" INCUBATOR.
SEE PAGE 740.

Some thirty or forty years ago, when there was no end of patent bee-hives with State and county rights for sale, I announced that no patents were wanted on a bee-hive—that all that was needed was a simple box without top or bottom, so several of them could be tiered up one above another according to the size of the colony or according to the yield of honey; and that the whole crop of honey, especially where the extractor is used, could be thus tiered up until the end of the season, getting not only a larger quantity but a very much *better* quality. This hive I called the "Simplicity," and I said it should not cost, frames and all, more than a dollar per story; and I think I said then that the time would come when the hives the world over would be made after this pattern. I leave it to you to decide how far this has proved true. In view of the wintering problem I did, however, advise the chaff hive (with permanent bottom) for winter.

Well, friends, here in my old age I am just about announcing the advent of the "Simplicity" *incubator* for the poultry business. I shall have to give it to you to-day, however, in a crude state, for it is not yet worked out; but I believe I have struck on the general principles of what is needed in an incubator. I suppose the old experts will laugh at my folly. Well, the expert bee-keepers of forty years ago, especially those who owned patents on certain hives, tried to laugh down my Simplicity "dollar" bee-hives—simply an open box that you could look right through or slip over your head. I have thought best to submit to you this Simplicity incubator a good deal for the fun of it. It will probably set incubator men to *thinking*, even if it does not do any thing more. If you will turn back to page 681, Nov. 1, you will see what started this innovation in the way of incubators.

Fig. 1 gives you a glimpse of the machine just as I have been using it. The pretty little fixture looking something like a lamp-shade on the pavement beside the incubator is one of the shelves that hold the eggs, and which will be explained further on.

Fig. 2 shows the incubator with the top and outside cover removed. This outside covering is made of a piece of galvanized half-inch mesh wire cloth, covered on both sides with Canton flannel, with strips of tape doubled and sewed over the edges clear around. Fig. 3 shows the same with the shelves also removed.

In order to explain the construction I will remark that the hot-water can that takes the place of the tea-kettle in my former description is made of a sheet of the best quality of roofing tin, size 20x28. Cut off a strip 7 inches wide so as to leave the larger piece 13x28. Have the tinner roll this up in the shape of a can or pail. This can will be 13 inches high and about 8½ inches in diameter. Now, this is to have a bottom so it will hold water. But a two-inch tube is soldered into the center of the bottom, running clear up through, as you see in cut No. 3. This is for the lamp-chimney. A damper is put in the top that you can open and close to regulate the heat. On one side of this chimney there is a little cup with a hole in the bottom to hold the thermometer. On the side opposite the thermometer is a can with a screw cap. This is for filling up the apparatus with water.

Now, in this machine I am using there is a covering to our water-reservoir, permitting this chimney to go up through said cover. This cover is about three inches below the top edge of the can. Now, I have not decided whether such a cover is needed or not. With the temperature kept up from 100 to 114 or 115 there will be considerable evaporation. Should there be too much evaporation for the benefit of the egg, this top will need to be closed more or less. My opinion is, however, that it does not matter so very much provided the eggs are not subjected to a dry heat that enlarges the air-bubble in the egg too rapidly. I know only this: The machine does hatch nice strong chickens just as I am using it.

Now, this tin can, as I have described it, is fastened by screws to a base-board made by crossing the grain of the lumber so as to prevent warping. This base-board stands on legs to accommodate the lamp underneath. This lamp is made of the strip of roofing-tin cut off when we first started. The lamp is 2 inches high and 8½ inches in diameter. This will hold three pints of oil; and if you use Pratt's Astral water-white oil, such as I purchase of the Standard Oil Co., one lampful of oil will hatch your eggs; and if you get this grade of oil made specially for the incubator you need not trim the wick nor even turn it up and down during the whole hatch. Just now it is a wonder to me that all incubator manufacturers do not insist on having their incubators run with this grade of oil. Why, I have fussed and bothered with the smoking sooty incubator lamps for four winters, and probably lost many chickens just because I did not invest a few cents more in a kind of oil that would not gum up the wick. You can not get it in your common stores and groceries; and I did not succeed in finding any in Tampa, Florida; but I did get a barrel of it from the Standard Oil Co. in Jacksonville, Florida, and this company, I think, can furnish it at any of its depots. If I have not done any thing else in my experiments with incubators I have certainly discovered that it does not pay to be worried and vexed with the cheap oil commonly used;

* At the time I suggested and invented the Simplicity bee-hive I signed myself "Novice" because I was at that time a veritable novice in bee culture; and I suppose I might truthfully subscribe myself just now a novice in incubators, for it is not *very* long since I *began* experimenting with them.

and, in fact, I do not see why anybody should fuss with this cheap oil of commerce when something so much better costs only a little more. Montgomery Ward & Co. furnish it, and say that no other kind should be used in an incubator, and I heartily indorse that statement. Let us now go back to our subject.

This tin can, as you will notice, is covered with a sheet of Canton flannel. I had more trouble in getting something for the shelves to hold the eggs than any other part of it. I had them made of pasteboard, of thin wood glued together with the grain crossed, and in different ways; but the high degree of heat, together with the dampness, warped them all out of shape so that it was a bother to handle the eggs and get them to stay in place. One morning when I had been puzzling over the matter I awoke between four and five o'clock, and had the thing all worked out in my mind before I got up. Just as soon as the whistle blew I had one of our tinners make four wire hoops 14¼ inches across. Then I had him make four smaller ones just 9 inches across. Then I went into the wood-working department and asked the boys to make me some strips of wood 1x3 inches, with a saw-kerf cut across both ends that would just take in my wire hoops. They go in so snug they had to be driven with a hammer, and then driven down with a suitable punch. This made the four pretty little shelves that you see in the cut. In order to hold these shelves securely the proper distance apart, some clips of tin are soldered to the water-boiler so that bent wires can be pushed down in, to support the shelves. These bent wires are something like the letter L, but not bent clear up at right angles. They stand out at an angle so as to support the shelf just right. Each shelf is supported by seven of these projecting wires. Just under the lower shelf you will see some copper trays—to hold wet sand; but I really do not know if these trays are needed. I have not yet decided. If they are not needed, another row of eggs can take their place.

On the upper shelf in Fig. 2 you see a little cloth fence to keep the chicks from tumbling out after they are hatched. This chick fence is shown again in Fig. 3. It is made of wire cloth covered with flannel. Now for the operation of the incubator.

Each shelf holds 14 eggs. As explained in our issue for Nov. 1, you are to place 14 *more* eggs outside of the circle that rests against the hot-water tank. As there are 28 on each shelf, we shall have 112 eggs in this small and compact incubator; and you can put in 130 eggs to run up to testing time if you choose.

Now for the principal objection to this small and cheap incubator. It is the changing of the eggs every eight hours as I have explained. The way I do it now is to have a coat with side pockets capacious enough to hold 14 eggs apiece. Take off the 14 cool eggs on the lower shelf and put them in your left-hand coat pocket. Now take off the 14 hot eggs and put them in your right-hand coat pocket; then with both hands rapidly take the eggs from the shelf above and put them in the one below. This will leave the top shelf empty. Now take your cool eggs out of the right-hand pocket and put them down against the boiler; then put the warm eggs on outside of the hot ones, and your incubator is ready to close up. Put on your cloth-covered hoop, hook it up and slip in the wooden cover, and let them remain another eight hours. Both top and bottom of this incubator *can* be further protected with cushions. Of course, there must be a hole in the upper cushion for the chimney of the lamp; but so far I have not used any cushion; and if you have an incubator cellar that varies but little from 70 degrees I do not think you will need any. By the way, when I said 3 pints of oil would make a hatch it was with the understanding that your machine is run in a room or cellar that keeps pretty close to 70 degrees. I have not yet decided on the best temperature for the water in the boiler; but I think that anywhere from 110 to 115 will be all right. I have several times had the temperature up to 120 degrees; and I am sure this does no harm if you are careful to change places with the eggs every eight hours. The whole secret of the success of this cheap incubator is in the alternate warming and cooling of the eggs; and I think that our incubator manufacturers are getting on to it. In a little book just out, by Mandy Lee, I see the statement made that a sitting hen lets her eggs vary as much as 7 degrees; and this agrees with my observation. I believe you will get more and stronger chickens with a temperature that is alternately up and down than where you have it right steady at 103. As a proof of it I should like to show you strong healthy chickens that were hatched out in September and October by this method. Unless your apartment becomes very cold I would not put any blanket or other insulation around the cloth-covered cylinder. This cloth cover, like the cloth-front poultry-houses, gives pure fresh air without any draft, and confines the heat as much as is needful.

HAWKS, SKUNKS, ETC., AND THE POULTRY BUSINESS.

Dear Friend Root:—I usually read your department in GLEANINGS about the first thing. Indeed, it was largely because of it that I subscribed for GLEANINGS. There are other good bee-papers, but only one "Our Homes" with its sound sense and Christian helpfulness. Your chicken experiences are always quite interesting, though I sometimes think you worry unduly about force. A chicken, like all animals, is merely a living, automatic, soulless, unreasoning, unmoral machine, and force is sometimes the only effective way of governing and training animals. But I write this letter to commend all you may say about the desirability of exterminating hawks and "varmints." I just came in the house from chasing a skunk out of the chicken-house where he had been busily thumping a glass egg for half an hour in the vain attempt to break it. Yesterday he got four good eggs that I know of. Now that I have visibly determined the guilty party, I shall feed him one more egg—and he will thereafter make good fertilizer, I am thinking. I might try to catch him and express him to your subscriber who, I notice, protests in the current GLEANINGS that everybody but himself and his coterie of nature-lovers are *fools*, killing off *friends*. He evidently belongs to that class that induced the Pennsylvania legislature to pass that idiotic bill *protecting bears!* The last legislature repealed that law; but in all the

States we are in danger of this wild-animal freak legislation.

Yesterday I came upon a hawk with five dead chickens around him, and a sixth so injured I had to kill it. My timely arrival prevented further slaughter. I wish I could present this hawk (indeed, all the hawks and skunks around my place) to your Iowa critic. I notice he refers you to Fisher's circular on hawks. Fisher's work was long ago discredited as worthless—a waste of good paper. His writings are valueless. As Editor Robinson, who is one of the most cautious and conservative, and, indeed, the leading poultry writer in our country, recently said in *Farm Poultry*, "No sane farmer would follow the teachings of Fisher and his class of Department of Agriculture scribblers." Please note, I say *his class*, for not all the Department's writers indorse his vagaries. In the first place, negative evidence does not amount to a row of pins except as giving a hint or suggestion until positive evidence can be obtained. Fisher s house of cards is built on merely negative evidence, and long ago tumbled to pieces in the face of positive evidence against his vain theories. In the second place, it is not nature and species that determine the diet of hawks and varmints and other animals. It is *environment*, and that alone. Vegetarian animals such as the horse and cow have been known to become carnivorous when wrecked on some barren and deserted island; and, having only fish or other animals as food, they have subsisted on them; and for a carnivorous animal such as a hawk or skunk to change from one form of animal life to another is a much smaller change. It does not require starvation, but mere opportunity to cause such slight change.

Primeval natural forest conditions are one set, and destroyed forest and artificial civilized conditions (farms) are an entirely different set. The balance of nature has been destroyed, environment changed; the elusive rabbit is supplanted by the non-elusive chicken. The hawk is not going to sit around hungry when a chicken is in sight if he thinks the chicken is unprotected; and, indeed, they are often bold enough to make their raids when a man is near. It is locality, environment, ease of capture, not species, that determine what variety of meat a hawk will eat.

The statement that a hawk patrols a field in search of field mice is not true. In the first place, patrol implies intentional guardianship, whereas a hawk guards nothing but its own nest. In the second place, the hawk is not after field mice. It is after its breakfast, dinner, supper, lunch, victuals, not voles. If a rabbit incautiously ventures out and does not notice the hawk, the rabbit, instead of the mouse, is promptly taken. If a chicken comes into view, the chicken is taken. Meat, not mouse, is what a hawk is after.

In autumn, when the cornfields are bare and the protecting corn-shocks are removed for shredding, the field mice are suddenly exposed and easy of capture. The hawk's stomach contents will then show field mice; but when grass is long, and mice hide easily, while the inexperienced young chicken has not yet learned to be always on the watch, the chicken is the easiest prey in sight, and the hawk takes it. That chickens are the natural food of hawks, no chicken will dispute. It will be uncertain about a crow; it will be interested in a buzzard; but, if he catches sight of a hawk near, the chicken of any size will let out a yell and break for tall timber, and not stop to argue the question. It knows the hawk is his foe, not friend, and he does not care a rap what nature-lovers may think the plan of the garden of Eden was. It knows the plan of this present earth is "hawks eat chickens," and it, at least, has sense enough to act on what it knows. It may have been the plan of the garden of Eden for the lion and lamb to lie down separately in peace. The plan to-day, however, is for the lion and lamb to lie down together with the lamb forever more at peace—inside the lion. To sentimentalize about hawks patrolling as guardians for men will never vitalize a valuable, pure-blooded dead chicken that the hawk kills. On the other hand, if we cease to be nature-lovers, and cease to sentimentalize, and become pseudo-scientists, and "sic" one pest on another, hawk against mouse, that is a cruel, bloodthirsty, and also inefficient plan—certainly not the plan of the garden of Eden. To be torn to pieces, limb from limb, is worse than to be killed by artificial means. Would you rather be shot, or killed by a lion? Not only can man be more humane in destroying pests than are birds or beasts of prey, but he can be more effective. He can kill off every pest, and he himself survive in better condition than ever. On the other hand, if birds of prey really confined themselves to pests and then really killed off the pests, you would then have left on your hands a horde of birds of prey with no food in sight. They would then give their entire attention to the poultry-yards, and, as Editor Robinson well says, the last state of the poultryman would be worse than his present state. Man, by his own skill, must be his own defense against all nature, from thistles and typhoid to hyenas and hawks. He may make use of an animal that is trained, controlled, as a hunting-dog or a trained falcon or hawk. But an uncontrolled wild dog or wild pigs or wild cats or wild hawks are only a menace in a civilized, settled farming community.

In closing, as regards the nonsense in Fisher's bulletin on hawks, let me refer you to the August issue of *Farm Poultry*. GENESIS FARM.

Greencastle, Ind., August 6, 1909.

The above may be rather tough on the hawks, but I think it is, perhaps, about right after all. The article reminds me that I have often wondered why my Florida chickens pay no attention to turkey buzzards that come around almost every day, and often alight in the poultry-yard. How do they know, when hawks and buzzards are but little specks away up in the sky, that one is an enemy and the other is not? The old rooster will twist his head around on one side, get a glimpse of the hawk, give a note of warning which the others take up, especially the hens with chickens, and in a jiffy they are all under cover out of sight. In fact, I have left bushes and scrub palmettos through all my poultry-yard for shelter for the chickens. Years ago I started the poultry business on a small scale down in our basswood orchard. I think it was when snow first fell that I came near the chicken-house one day, which was back in the woods among the basswood-trees. Every thing was strangely silent. On looking over the fence in a field I found the white snow literally covered with blood, over quite an area, and a half-dozen full-grown chickens, or the mutilated remains of that many, were scattered through the snow. The rest had disappeared somewhere; and they were so terribly frightened that some of them did not come out of their hiding-places, as nearly as I could determine, for nearly two days. That one experience wound up my chicken speculation out in the woods. No doubt hawks and skunks are sometimes a benefit to the farmer; but after they have once made a raid on the chickens I would recommend extermination.

EIGHT YEARS OLD AND STILL LAYING.

I do not keep bees, but take GLEANINGS mostly for the home and poultry departments. I should like to say to Mr. A. I. Root that I have two Plymouth Rock hens that are over eight years old, and they are among my best layers. They have never raised a family of chickens, and try to sit about only twice apiece each year. I break them right up of wanting to sit, and soon they are laying again. MRS. ALICE A. KESLER.

Winnebago, Minn., Nov. 8.

SWEET CLOVER, AND THE WAY IT IS BEGINNING TO BE RECOGNIZED.

A subscriber calls our attention to an article on sweet clover, from *Hoard's Dairyman* for July 21. He copies a part of it as follows:

Strange as the claims made by practical feeders for the feeding value of sweet clover may seem, even wider claims are made for it as a fertilizing agent. Its fertilizing value is claimed to exceed its value as a forage crop. Out here we recognize its fertilizing value as very high—more so than that of any other clover. C. H. CLARK.

Albia, Iowa, July 27.